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ABSTRACT

This volume consisting of state of the art reviews, suggestions and guidelines for practitioners, and program descriptions deals with the current and potential applications of computers in the delivery of services for vocational rehabilitation (VR). Discussed first are current applications of computer technology in rehabilitative service delivery. The next chapter focuses on the potential applications of electronic mail, computerized data banks, computer-based education, distributed data processing, and decision supportive systems in VR service delivery. Also provided are suggestions for developing counselor and client information systems. The next three chapters review available computer hardware and software as well as their potential use by VR staff, present organizational approaches to planning and introducing new technology into the VR service delivery system, and suggest factors to consider before increasing the degree of automation in an existing VR delivery system. Concluding the volume are a glossary and a bibliography. Appendixes to the guide include descriptions of the Pennsylvania Bureau of Vocational Rehabilitation Automated Information System, the Occupational Information Systems, and the Oregon Issues Identification and Tracking System as well as papers dealing with computer graphics in vocational rehabilitation, uncomplicating software acquisitions, and computer acquisition and operation. (MN)

Computer Assisted Rehabilitation Service Delivery

8TH INSTITUTE ON REHABILITATION ISSUES

ED237743

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Computer Assisted Rehabilitation Service Delivery

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Foreword

This document was prepared by a Study Group of the Institute on Rehabilitation Issues. The Institute on Rehabilitation Issues is a cooperative effort by the National Institute of Handicapped Research, Rehabilitation Services Administration and the Council of State Administrators of Vocational Rehabilitation to develop resource materials on topics of common concern.

Overall objectives for the Institute on Rehabilitation Issues include identification and study of issues and problems that are barriers to optimal vocational rehabilitation services and the development of methods for resolving problems and incorporating solutions into state programs.

These objectives are carried out by bringing together competent and experienced rehabilitation personnel from all levels in a three stage process:

1. A Planning Committee selects the topics to be studied;

2. A Prime Study Group develops a draft document on the topic selected;

3. A Full Study Group reviews the draft document and recommends revisions.

This document resulted from such a process. (See appendices for listing of Study Group members.)

While the Institute on Rehabilitation Issues has existed only since 1973, it is a continuation of a program which has existed for over 30 years. Beginning in 1947 the Guidance, Training and Placement Workshop, through state and federal vocational rehabilitation agency cooperation, studied and explored topics in depth by means of small work groups. This work was continued by the Institute on Rehabilitation Services established in 1962 and currently by the Institute on Rehabilitation Issues.

This cooperative effort has over the years consistently produced quality training materials which are used extensively throughout rehabilitation. It is hoped this document continues this long-standing tradition.

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Chapter 1

Introduction

6:30 a.m. The temperature edges below 65 degrees and the furnace burner puffs into flame. Moments later the blower fan adds another sound in the stillness at 9613 Freeborn Lane.

6:40 a.m. The dimly glowing numerals of the digital clock attest to the time as the clock radio emits the intentionally unobtrusive melodies from a carefully chosen FM station.

6:43 a.m. The temperature is now 69 degrees. The blower and burner are quiet again.

6:45 a.m. The music of the violins reaches Joe's consciousness. The insistent buzz of the alarm overrides the music. Eyes still closed, Joe finds the button on the snooze alarm. The buzzing stops; the music plays on.

6:51 a.m. The buzz is too much this time. Joe pushes the button again and slowly swings his feet to the floor. Another day begins.

6:53 a.m. Joe looks out his window as the street lights go out up the hill beyond 95th Street. Stumbling to the bathroom, he notes mentally that the light sensor in his backyard should be catching enough early morning sun to turn off the light behind the garage too.

6:54 a.m. Jean - wife, mother, R.N., whose late night nursing shifts are the reason for the automatic backyard light and the new electronic garage door opener - sleeps on.

6:55 a.m. It's the coffee maker's turn. The coffee grounds, water and dial settings Jean put into the coffee maker last night go to work. Joe is in the bathroom showering with water automatically heated to a preferred temperature. His "no nick/no burn" electric razor, electric toothbrush and hair dryer lie ready on the bathroom counter.

7:10 a.m. Joe arrives in the kitchen, pours a perfectly brewed cup of coffee and goes to get the morning paper from the porch. He glances at the headlines but a look at the small print reminds him his reading glasses are upstairs on the nightstand. Rather than risk waking Jean, he turns on the TV to the 24-hour news channel. He pops a frozen English muffin with cheese and bacon into the microwave and sets the timer.

7:20 a.m. Joe recognizes that the satellite coverage of the latest plane hijacking in the Middle East, although interesting, is about to offset his good feelings from the muffin and coffee. He picks up the remote control and changes stations.

"I'm glad we have the cable hookup," Joe thinks. "It sure brings in lots of things." He checks the time on Channel F against his wristwatch (digital, stopwatch, alarm, day, month, year - all for under $50 at the local discount store). Idly switching from station to station, Joe gets a quick update on today's programming, current and predicted temperatures with satellite pictures of the nation's cloud cover, and yesterday's closing prices on the New York Stock Exchange. He passes up "Beginning Algebra", "How to Make A Darling Dessert", and the cheerful chatter of the network morning shows. The last sip of coffee and the last channel conveniently come together.

7:30 a.m. After putting the dirty dishes in the dishwasher, Joe goes into the den for his attache case. He puts the reports he completed last night, his pocket calculator and portable dictater into his case, and heads for the door. The day is underway.

7:45 a.m. Jill dashes from the parking lot into the entryway of the not-yet-open bank. Feverishly searching through her purse, she finds her bank card and inserts it into the electronic teller. Alternately reading instructions from the screen and pushing buttons, she soon has her much needed cash, a record of her withdrawal and the new balance in her account.

"Why do I always let the kids clean me out every Monday morning," Jill wonders. "How did I ever get to work with enough money for lunch before they put in this machine?"

8:10 a.m. Jill stacks the household bills received since last Monday on the corner of her desk. She glances at the wall clock and then quickly over her shoulder at the vacant chair in her supervisor's office.

"Twenty minutes before start-up time and the ogre isn't here yet. I should have time to pay a couple of them," she says quietly to herself.

In rapid succession, Jill opens the statement from the phone company, lifts the receiver of her Touch-Tone phone, and pushes the buttons. Across town, the computer of Midstate National Bank digests the instructions to transfer $26.20 from her account to that of the phone company. Jill replaces the receiver as her supervisor steps off the automatic elevator, and grunts out a "Good Morning" on the way to his office.

8:15 a.m. "Good morning, workmate." Fred's cheery greeting catches Jill unaware as usual.

"You startled me, Fred. Why don't you use the elevator like everyone else?"

Fred grins obviously enjoying her reaction. "Well, Jill," he replies, "since old Herman here does all the work, I need to get my exercise somehow." As he might a favorite child, Fred pats Herman gently.

8:30 a.m. Jill takes a ring of keys out of her purse, selects one and unlocks the computer terminal in the shared space between her desk and Fred's. She switches it on and remarks to Fred, "You're right. Herman's a real demon for work. See, his eye lights up just thinking about it."

As she speaks, the screen lights up and a message appears. "GOOD MORNING! WHAT CAN I DO FOR YOU TODAY?"

After a few well-worn comments about the amount of spare time the programmers must have, Jill's face takes on a more serious expression.

"Fred, you know it's really strange. I've used old Herman here all day long for over two years now. He gives me up-to-date figures on how many pieces of 'whatever' we have in any of four warehouses and sixteen stores scattered over five states. I can get the price, stock number, description, date and location of purchase. I can change prices, initiate action to redistribute any item or group of items from one place to another and never move more than three feet from Herman's face. At the same time, I know the personnel department is using a computer to keep track of my vacation, sick leave, health insurance, Social Security and pension contributions. They even electronically transfer my paycheck directly to my bank."

Fred rocks back in mock horror. "Wow, that is strange!"

Jill laughs. "Oh, shut up, Fred. I haven't made my point yet. This morning I paid my phone bill with Midstate's phone-check system for the first time. All the time I was doing it, I was afraid it wouldn't work. In fact, I've been putting off trying it for two months. *That's* what's strange."

8:45 a.m. "How can I help you today, Mr.Farley?"

"I need some plane tickets, Jerry. I would have called you, but Mrs. Farley wanted some brochures on Mexican vacations. The tickets are for a business trip next week. The Mexico thing is still in the dream stage."

"That's fine, Mr. Farley. Where do you want to go and when?"

Jerry types the information into the computer as Mr. Farley responds. "Well, I have to leave here in time to be in Phoenix by 11:00 the next morning."

Mr. Farley continues with his specifications, naming places, times, preference for non-smoking, an aisle seat during short hops, a window seat during the long stretches if dinner is served. Jerry alternately types, reads the information on the screen, and asks more questions.

Finally, Jerry looks away from the computer and says, "I can confirm everything but that 2:30 p.m. flight on Wednesday. But there's another flight at 5:00. Shall I confirm that and wait list you for the 2:30?"

Mr. Farley frowns, then agrees.

9:05 a.m. Mr. Farley is back across the hall in his own office, still grumbling about the extra two-and-a-half hours wait.

At the travel agency, Jerry congratulates himself and the ticket reservation system.

"In just 20 minutes, we checked out connections to five cities in four states involving six airlines. We not only checked the schedules but got him what he wanted right down to seat selections, except for one flight. And, wherever he goes on that trip, all the airline clerks will have that information at their fingertips."

9:10 a.m. Mary takes the groceries from the cart and sets them on the revolving counter by the cash register. On the other side, the checkout clerk takes each item and runs it over the electronic scanner built into the countertop.

Judy, a five-year old Mary look-alike, stands next to her mother watching the price of each item flash on the small screen by the cash register. The last item crosses the scanner and the clerk pushes the "total" button. There is a final whirring as the machine automatically separates the non-taxed items from those requiring tax, calculates tax and total, and prints it on the paper tape.

Mary looks at the total shown on the screen and asks, "May I see the tape, please? I want to see what that cake mix costs." She reads down the list and finds cake mix 79 cents. "It's OK," she says. "I just wasn't sure how much it was."

Mary writes a check for the amount and hands it to the clerk who notes the name, address and phone number printed on Mary's check and punches those numbers into the register. Almost instantaneously, a small green light comes on indicating the check has met the requirements of the store's check verification system.

Nearby the store grocery manager watches with boredom. Only a year ago, the same manager would have been greatly excited watching the same scene for the first time. Then he was fascinated by this system which could do so many things — not only handle the grocery check out but maintain records for inventory control, sales tax payments and almost any other special report the store management might want.

9:20, 9:45, 10:31 a.m. On throughout the day, people all across the US, Canada, and Mexico - in fact, almost all points north, south, east, and west — are, like Joe, Fred, Jill, and the others, reaping the benefits of computers and other information processing technologies. Some of the applications are so common we don't even think of them much anymore. Others make us nervous because the technology is new and not as tested as we'd like, or because we've not been personally involved, we don't know how it will affect our lives.

Technology for the processing of information has been available for many years in such now-common items as typewriters, calculators, filing and bookkeeping systems, dictating equipment, etc. It is only since the advent of the computer, however, that startling and rapid advances have occurred. Since its creation in 1946, the computer has made a powerful impact on business, industry, and science. In fact, it is difficult to identify a field which has not been influenced, either directly or indirectly, by the computer.

By the end of this decade it is estimated that computers and computer-related activities comprise one-third of our gross national product. Futurists suggest that by the year 2000, almost all work in the US will involve interaction with computers. Computers will be used in the controlling of industrial processes; the flow of economic goods and services (finance and commerce); transportation and traffic. And they will be prominent in managerial operations; federal, state and local government functions; and ac-

tivities of service and professional occupations. Private household operations such as managing family finances, the home environmental heating and air conditioning systems for conservation of energy, house security, automobile and appliance maintenance and menu planning, all will be aided by computers. As much as half of the American work force will work from their homes, with a computer linking them to their employers.

The exchange and processing of information are central and continuing functions in the delivery of rehabilitation services. For example:

- Historical and current characteristics of clients - Identifying data, medical history, functional capacities, mental abilities, social/family history and behaviors, work history, skills, educational attainment data
- Community characteristics - Transportation, housing, power structure, communication channels, social agencies, helping personnel, medical facilities
- Employment data - Employers, products, locations, jobs, job requirements, hiring practices and procedures
- Training and education resources

Although incomplete, these significant chores obviously involve systematic gathering, organizing, storing, retrieving, analyzing and transmitting of information within the service delivery process.

The generation, storage and transmission of information absorb vast amounts of time, energy and paper. Efficiency in handling such information is of enormous importance in securing the appropriate services and assistance for rehabilitation clients. Rehabilitation personnel are hampered if the proper information is not available, up-to-date, and presented in a useable form.

This publication, therefore, will review the kinds of assistance rehabilitation is securing from computers and will describe potential uses of computers and related technology.

Objectives

The 1980 Institute on Rehabilitation Issues Planning Committee concluded there is a need for a publication that describes computer and information processing technologies, and includes strategies and guidelines for applying such technologies to service delivery in vocational rehabilitation. Such publication should be written for VR counselors, supervisors and administrators. The Planning Committee further indicated the purpose of the publication should be to assist in securing the advantages of such technologies to improve services to clients, and to increase efficiency and effectiveness of rehabilitation personnel.

The Prime Study Group established a number of objectives in carrying out the charges of the Planning Committee. The objectives relate to the content and organization of the remainder of this book.

Objective 1: To identify and describe the major ways computers are currently being used to assist service delivery in state vocational rehabilitation agencies. It is important that rehabilitation personnel know how their counterparts in other agencies are getting assistance from computers. Information related to this objective, found principally in Chapter 2, was secured from inquiries directed to state rehabilitation agencies throughout the country about their uses of computers and other automated information processing for service delivery.

Objective 2: To identify and describe uses of computers which have potential for adaptation to vocational rehabilitation service delivery needs. The applications presented in Chapter 3 were identified from the literature and from personal observations and experiences of the authors. While the coverage, therefore, is not intended to be exhaustive, it is apparent that many computer-related assists which could be made applicable to VR service delivery already exist in other settings.

Objective 3: To describe a vocational rehabilitation office as it could exist today if computers were optimally used to assist counselors, supervisors, administrators, support personnel, and clients. The description is not futuristic, but rather pulls together applications currently being

done somewhere. There are many ways to combine the delivery of rehabilitation services with high level use of the computer. Chapter 4 presents one of those ways.

Objective 4: To describe in basic and simple terms the major elements of computer systems — hardware, software and personnel. While some readers already may have such basic information, many people in vocational rehabilitation will be able to use this book more profitably once they have read Chapter 5.

Objective 5: To present some guidelines for planning the development of new or expanded computer systems within a vocational rehabilitation agency. Successful and effective systems grow out of thoughtful and broad-based planning efforts. Just as computer technology has advanced and changed rapidly since its introduction 35 years ago, so has knowledge of how to design the systems and plan their introduction into an organization. Chapter 6, written for vocational rehabilitation workers at all levels, presents the essential planning elements and steps.

Objective 6: To place in proper perspective the problems, fears and antipathies often associated with computers. VR personnel at all levels need to make better decisions about how computers can and should be used in the future to improve services to handicapped persons. Attempts are made to address Objective 6 throughout the book, but in Chapter 7 specific processes are outlined to assist an organization prepare for new or expanded uses of computers.

Throughout the book, the Prime Study Group presents the view that technology can be used to the advantage of rehabilitation consumers and providers. Better tools and methods for delivering quality and timely services must be developed. Computers can assist in that process.

A few words are needed to clarify what this book is not designed to be. It is not a complete list of information processing applications to VR. It is not an exhaustive inventory of computer hardware and software. This book will not make anyone an expert on information processing technologies or computers — or anything else for that matter.

Similarly, not covered in this publication is rehabilitation engineering — the development of aids and assistive devices, and the modification of the environment for disabled persons. Also, no attempt is made to examine the uses of technology for purely administrative or organizational management functions within rehabilitation agencies. Where, however, there was a question regarding an application, i.e., whether administrative or service delivery, the tendency was to include rather than exclude.

Chapter 2

Current Applications In Rehabilitation Service Delivery

Most vocational rehabilitation agencies have been using computers for many years to compile information and statistics for federal reporting. The R-300 form contains 79 items of information that must be reported for each closed case. Most state agencies collect additional information to meet other federal requirements and for unique state needs. For agencies with large caseloads, the computer has become essential in meeting reporting, evaluation, and management needs.

The information gathered for the R-300 and other federal reporting is the core of every vocational rehabilitation agency's data base. Using this core of information, states produce unique reports for internal use by varying the mix, adding new items and processing the information in a variety of ways.

Many of the intrastate reports, both routine and ad-hoc, are directed toward management of the agency, a district or region, a unit or caseload. Field staff are the major source of data input but, in many cases, they get little pay-back for the time and effort it takes to collect and input the required data. The amount of pay-back varies depending upon how the data are organized, stored and accessed.

The state of the art within VR agencies ranges from manual collection and aggregation of information in small agencies to real time, on-line systems capable of ad-hoc reporting. A limited survey of those state agencies considered to have comprehensive data systems was conducted to determine how computers are being used to facilitate service delivery at the field level.

The results of the informal survey confirm that information processed and stored in computers or word processors is being manipulated primarily for management purposes. Management, in this case, should be viewed as the process of achieving one's purpose within limited objectives. In this context, counselors and first-line supervisors benefit from the data systems in their caseload management functions.

This chapter looks at the reported current applications that relate directly to service delivery. Some of the applications may seem oriented toward administrators but they also may be seen as assisting field staff to achieve their objectives -the primary one being the employment of handicapped people. Content focuses on counselor needs, technology for clients, technology for support services and impact on staff.

Counselor Needs

Counselors are responsible for supervising the rehabilitation process and coordinating with a large and diverse number of people simultaneously. To manage a caseload, a counselor must:

1. Know his or her clients and their current status

2. Arrange for services

3. Insure that clients progress through the rehabilitation process

4. Complete reviews at proper intervals

5. Maintain fiscal responsibility.

While the computer cannot manage a caseload, it can be an excellent source of information, listings, and reminders; it can sort, organize, and keep accounts. Properly programmed, the computer can relieve the counselor and supervisor of routine record keeping and filing; it can remind the counselor or supervisor of tasks to be performed.

The following discussion describes some of the more innovative case management tools available to counselors. Most of the information included in these reports is collected routinely for R-300 reporting.

Client and Status Listings

All the agencies surveyed provide each counselor with a computer listing of his or her clients. This listing may be in alphabetical, numerical, or client status order.

Counselors in Oregon receive the Field Caseload Report. This monthly report includes for each client: name, social security number, funding source, status, months in status, life-of-case expenditures, trust fund or SSI status, and whether the client is severely disabled. In addition, the report flags required annual reviews and decision points based upon the agency's time-in-status standards (See Example 1).

Tennessee counselors use the Master List of Cases to gain immediate access to their client's name, case number, county, referral date, current status, date entered status, months in status, SSDI and SSI statuses, severely disabled status, and action that may be required.

The Alabama Caseload Inventory not only provides a listing of clients by current status, but also gives the date of last action taken, the date client was referred, and the number of months client has been in his or her present status.

A Master List is produced in Arkansas that includes name, client number, referral date and source, county at referral, disability, date of application, and a variety of other basic information. It is used both as a master list and as a turnaround document. That is, counselors record the changes in items such as status, special programs, SSDI and SSI statuses, and similar benefits codes on the form. This information is then entered into the system and appears on the next Master List (See Example 2).

The Pennsylvania Regular Alphabetic Printout* provides a counselor's caseload in alphabetical order. It contains the client name, client number, referral date, birthdate, primary disability, referral source, total unliquidated encumbrances, first two digits of job objective, current fund code, severely disabled indicator, SSDI and SSI control codes, transfer date, annual review date, current status, and months in current status. The uniqueness of this report is that it can be obtained at any time via computer terminal - display only or on paper (See p. 94).

In addition to the Regular Alphabetic Printout, a counselor in Pennsylvania can view on the computer terminal the Client Master File, which is a summary of a client's data file. It provides information to counselors without the need to search through case files. The report includes referral, acceptance and closure information, case movement, cost data, vocational objectives, and review dates. If a copy is needed, the counselor can have it printed (See p. 95).

New York provides a three-part Counselor Caseload Report to its counselors on a monthly basis. The Client Listing Section arranges cases alphabetically within case status (See Example 3). The Caseload Statistics Section provides monthly and year-to-date statistics by case status, including number of cases in each status, number of cases in that status for an excessive period of time, the percent of cases in each status and

*The Pennsylvania Bureau of Vocational Rehabilitation is one of a limited number of states that has an on-line system with on-site terminal input and output. Several of their reports are included in Appendix A to provide an overview of one system.

VOCATIONAL REHABILITATION DIVISION
FIELD CASELOAD REPORT
FOR THE MONTH OF DECEMBER 1981

PAGE 83
1-18-83

1983

ASW	FUNDING SOURCE	STATUS	MONTHS IN STATUS	FLAG	LIFE OF CASE EXPENDITURES PRE-PLAN	PLAN	LIFE	TR/SSI	SEVERE
		18	8		90.00	993.90	1,073.90	CERTIFIED	YES
		18	13		.00	2,808.75	2,808.75		NO
		18	6		16.00	2,916.56	2,932.56		YES
		18	5		.00	974.00	974.00		YES
		18	3		145.00	1,413.10	1,558.10		YES
		18	6		168.00	263.00	431.00	CERTIFIED	YES
		18	6		30.00	1,651.75	1,681.75		NO
		18	29	**	125.00	2,045.33	2,170.33		NO
		18	35		.00	8,160.14	8,160.14	CERTIFIED	YES
		18	6		242.00	851.87	1,093.87		NO
		18	31		.00	4,194.45	4,194.45	CERTIFIED	YES
		18	43		185.00	11,769.20	11,954.20	CERTIFIED	YES
		18	49		.00	21,172.10	21,172.10	CERTIFIED	YES
		18	5		85.00	84.00	169.00		YES
		22	6	**	40.00	4,469.32	4,510.32		YES

Example #1

MASTER LIST
REHABILITATION SERVICES

NAME	CLIENT NUMBER	DATE REFERRAL MO	DATE REFERRAL YR	DATE APPLICANT MO	DATE APPLICANT YR	DATE EST. ELIG. MO	DATE EST. ELIG. YR	DATE ACCEPTED MO	DATE ACCEPTED YR	DATE P.T. MO	DATE P.T. YR	DATE CLOSED MO	DATE CLOSED YR	CASE CLOSURE CODE	CHANGE STATUS TO	DATE CHANGE STATUS MO	DATE CHANGE STATUS YR	SPECIAL PROGRAM CODE	CHANGE SPECIAL PROGRAM TO	CHANGE SSD MO	CHANGE SSD YR	CHANGE SSI	CHANGE SSI YR	CHANGE DISABILITY CODE	CHANGE DISABILITY CODE TO	MONTHS
		77	70	42	157	77		77	77	157								077	000							
		478	70	42	222	478		478	478	1378	22					1178	400			1	0					2 0 8 0
		77	70	42	344	477		1177	1177	1177						1177	000									
		875	70	42	379	875		875	875	875	13					875	000			0	0					1 7
		1177	70	24	614	1177		77	77	77	77					875	000									2 0 4 5 4
		1277	70	42	510	1277		278	278	378	13					1178	200			0	0					3 1 1 1
		477	70	42	479	477		777	777	77						477	000									2 0 10 7
		478	70	42	432	678		678	1278	1278	18					379	000			0	0					0 0 11 2
						HAS						EVICTED														
		476	70	42	374	476		476	476	476	22					476	000			0	0					1 0 10 0
		1276	70	24	574	1276		176	176	176	22					276	000									1 1 1 1
		279	70	42	363	279		379	379	479	22					479	000			0	0					1 0 2 0
		1178	70	42	510	1177		1177	1177	1177	22					1278	000									1 1 1 1
		878	70	42	399	778		878	878	878	22					978	000			0	0					1 0 1 0
		1173	70	42	509	1171		1173	1173	1173	22					1278	000									
		478	70	24	530	478		478	678	778	22					379	200			0	2					2 0 11 0
						HAS						EVICTED														

Example #2

16

COUNSELOR CASELOAD REPORT: PAGE 678
DECEMBER 1980

OFFICE: POUGHKEEPSIE COUNSELOR: 08 1 6

CLIENT NAME		CLIENT NUMBER	REFERRAL DATE	MAJ DIS	SEC DIS	SEV DIS	PROGRAM CODES	VOC OBJ	COMP DATE	CURRENT IF	SSI	PA	BENEFIT START	NET ENCUM (TO DATE)	NET ENCUM (FED FY)	NET ENCUM (ST FY)	MTHS IN STATUS	
*STATUS - 00																		
	W	B14858	10/16/80			3	00		00/00	0	0	0		$ 0	$ 0	$ 0	2	
	G	A31006	11/16/80			3	00		00/00	0	0	0		$ 0	$ 0	$ 0	1	
	D	B14773	10/01/80			3	06		00/00	0	1	3	11/01/80S	$ 0	$ 0	$ 0	2	
*STATUS - 02																		
	E	B48079	10/01/80			3	00		00/00	0	0	4		$ 0	$ 0	$ 0	2	
	J	B48083	10/27/80			3	00		00/00	0	0	0		$ 19	$ 19	$ 0	2	
	E	B14783	06/27/80			3	00		00/00	0	0	0		$ 55	$ 0	$ 0	6	
	W	B14804	07/10/80			*?*	00		00/00	0	0	0		$ 234	$ 72	$ 0	5	
	E	903225	02/21/80			1	04		00/00	1	1	0		$ 90	$ 34	$ 0	10	***
	C	B14053	04/17/80			3	00		00/00	2	0	0		$ 19	$ 0	$ 0	8	***
	W	B14739	09/21/80			3	00		00/00	0	0	0		$ 19	$ 19	$ 0	1	
	J	B48082	10/08/80			3	00		00/00	0	0	0		$ 0	$ 0	$ 0	2	
	T	283378	01/08/80	340	689	3	00		00/00	0	0	0		$ 55	$ 0	$ 0	11	***
	D	C04415	10/07/80			3	00		00/00	0	5	8		$ 0	$ 0	$ 0	1	
	G	B48084	11/20/80			2	00		00/00	0	0	0		$ 0	$ 0	$ 0	1	
	S	B48081	10/05/80			3	00		00/00	0	0	0		$ 0	$ 0	$ 0	2	
*STATUS - 10																		
	N	903239	03/06/80	399	999	2	00		00/00	0	0	5		$ 55	$ 0	$ 0	4	
	I	283384	01/25/80	120	999	1	06		00/00	0	1	3		$ 91	$ 0	$ 0	9	***
	T	514347	07/01/80	383	999	1	00		00/00	0	3	0		$ 55	$ 0	$ 0	1	
	T	B14330	07/07/80	379	999	2	00		00/00	2	0	0		$ 55	$ 0	$ 0	2	
	J	B14444	09/03/80	500	999	1	00		00/00	0	0	0		$ 55	$ 36	$ 0	1	
	C	B14829	06/18/80	399	999	2	00		00/00	0	0	0		$ 170	$ 115	$ 0	3	
	R	A45139	12/03/79	642	399	*?*	04		00/00	1	0			$ 72	$ 36	$ 0	1	
	P	B14786	06/27/80	614	999	2	00		00/00	0	0	0		$ 55	$ 0	$ 0	3	
	M	903361	05/22/80	522	999	2	00		00/00	0	0	0		$ 55	$ 0	$ 0	2	
	I	B48080	09/04/80	399	999	2	00		00/00	0	0	0		$ 55	$ 36	$ 0	1	
	C	B14799	07/14/80	379	999	2	00		00/00	0	0	0		$ 55	$ 0	$ 0	3	
*STATUS - 12																		
	J	060933	02/23/78	399	999	1	04		00/00	1	0	0		$ 50	$ 0	$ 0	3	
*STATUS - 14																		
	B	283259	03/21/79	530	999	2	00		00/00	0	0	0		$ 110	$ 0	$ 0	12	
	T	A31055	06/18/79	642	999	1	00		00/00	1	0	0		$ 155	$ 0	$ 0	11	
*STATUS - 16																		
	A	283375	01/08/80	378	999	1	04		00/00	1	0	0	01/08/80T	$ 2,805	$ 0	$ 0	7	
	J	283032	12/07/78	439	999	1	00		00/00	4	4	Y	12/21/78T	$ 7,252	$ 1,548	$ 0	3	
	C	283376	01/08/80	229	999	2	00		00/00	0	0	4		$ 510	$ 0	$ 8	7	
*STATUS - 18																		
	H	283256	03/09/79	500	999	2	00		00/00	0	[illegible]	0		$ 478	$ 465	$ 0	1	

Example #3

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average time in status. The Characteristics of Active Caseload section gives a counselor a detailed analysis of a counselor' s active caseload. The report summarizes the caseload by major disability, age, race, Hispanic origin, education, sex, public assistance, SSDI, SSI, Workers Compensation, and severely disabled.

Nevada prepares a monthly report which assists counselors serving Social Security Administration (SSA) referrals. The SSA Verification Status Report provides for each SSA-referred client: SSI or SSDI status, funds being used for services, verification code, if they meet special SSDI/SSI criteria, claim type, and re-examination date (See Example 4).

Client Review Reminders

Current rehabilitation legislation requires that: (1) Individualized written rehabilitation programs be reviewed on an annual basis, (2) Decisions of ineligibility due to inability to achieve a goal be reviewed annually, and (3) There will be an annual review and re-evaluation of all clients placed in sheltered employment.

The computer, if so programmed, can remind the counselor and supervisor to schedule the required reviews, and annual review reminders are included on some master lists. Below are some variances to the master list system.

The counselors in Pennsylvania can put a report number into a terminal and receive a listing of clients requiring an individualized written rehabilitation program annual review within a three-month period. The listing also notes those reviews due within the current month and those past due (See p. 96).

The Oregon Annual Review of Clients Closed 26 in a Rehabilitation Facility is a monthly listing of individuals closed one year prior in sheltered employment. If the counselor reports the individual is not yet ready for competitive employment, (s)he is listed again on the next annual report (See Example 5). A similar report is produced for the annual review of ineligibility decisions.

In Florida counselors receive a quarterly report for re-evaluation of ineligibility determinations. The report lists those individuals scheduled for re-evaluation during the upcoming three months. The results of the counselors' evaluations are entered on the listing and returned to supervisors (See Example 6).

In Washington they have an easy-to-read printout that identifies clients requiring reviews (IWRP, sheltered employment or ineligibility determinations). This Case Movement Exception Listing and Action Items Report is provided to each unit monthly (See Example 7).

Client Progress

In managing a caseload no client should be allowed to stay in any one status for an excessive period of time. A client who remains inactive may very well drop out of the VR process if special efforts are not made to encourage progress . Many states have devised methods for identifying apparent delays in case progress or for keeping time-in-status information before the counselors.

Rehabilitation legislation places an 18-month limitation on the time a client may be in the extended evaluation status. Many states have established time periods to be used as standards or guidelines for satisfactory progress in other statuses. A reminder of the approaching limit of such time periods has been programmed into computers.

The Exception List in Tennessee groups clients by days in status when the number of days exceeds expectations. For instance, it lists clients in status 02 for 120 days or more, clients in status 10 for 182 days or more, in status 12 for 91 days or more, etc. The list also includes for each of these clients the referral date, the date the client entered the current status, and the number of days in current status (See Example 8).

Oklahoma counselors are notified on a Message Sheet when a client requires an annual review, when a case has been in a particular status beyond the average time, or when an extended evaluation is due to expire (See Example 9).

SSA VERIFICATION STATUS REPORT

ACTIVE AS OF NOVEMBER - FISCAL YEAR 1982

CARSON CITY

ENSR YR.	CLIENT NBR	CLIENT NAME	VR STAT	SSDI CODE	SSI CODE	FUND CODE	CUR CRI	SSDI VERF CODE	SSDI DATE	SSDI CLAIM TYPE	SSDI DOC SRC	SSDI REXM DATE	SSI VERF CODE	SSI DATE	SSI CLAIM TYPE	SSI DOC SRC	SSI REXM DATE	SOC. SEC. NUMBER	REQ. FLAG
11	01820028		* 02	0	1	5	NO		00/00/00					00/00/00					
07	01820016		* 02	1	0	2	NO		00/00/00					00/00/00					
11	01800368		* 18	1	253	* *	MET	01	08/31/81	1	B		99	03/27/81	1				
13	01810322		* 02	0	3	1	NO		00/00/00					00/00/00					
11	01800133		* 18	1	0	2	MET	01	08/26/80	1				00/00/00					
13	01790112		* 20	1	0	2	MET	01	11/01/79	1			05	10/01/79	1				
11	01810070		* 22	1	253	*2*	MET	01	03/05/81	1				00/00/00					
11	01800408		06	0	0	1	NO	99	08/07/81	1				00/00/00					
13	01800221		* 14	1	0	*1	NO	01	06/28/81	1				00/00/00					

Example #4

ANNUAL REVIEW OF CLIENTS CLOSED 26 IN A REHABILITATION FACILITY

THE DIVISION IS REQUIRED TO PERIODICALLY REVIEW AND RE-EVALUATE, AT LEAST ANNUALLY, THOSE CLIENTS WHO HAVE BEEN PLACED IN EXTENDED EMPLOYMENT IN REHABILITATION FACILITIES, TO DETERMINE THE FEASIBILITY OF THEIR EMPLOYMENT, OR TRAINING FOR EMPLOYMENT, IN THE COMPETITIVE LABOR MARKET. THE DIVISION IS FURTHER REQUIRED TO EXTEND MAXIMUM EFFORT TO ACCOMPLISH THE PLACEMENT OR TRAINING.

THE FOLLOWING FORMER CLIENTS WERE CLOSED 26 IN A REHABILITATION FACILITY AND THEREFORE REQUIRE AN ANNUAL REVIEW TO BE COMPLETED NOT LATER THAN 2/18/81.

1. REVIEW THE STATUS OF EACH PERSON TO DETERMINE THE PERSON'S READINESS FOR ENTRY INTO THE COMPETITIVE LABOR MARKET , NEED FOR FORMAL TRAINING FOR EMPLOYMENT, OR WHETHER THE INDIVIDUAL'S EMPLOYMENT WITH THE FACILITY HAS BEEN TERMINATED.

2. PREPARE A WRITTEN SUMMARY OF THE RESULTS OF EACH STAFFING USING THE FAC31 SIGNED BY THE FACILITY DIRECTOR.

3. ENTER ONE OF THE FOLLOWING CODES UNDER THE 'CODE' HEADING AND RETURN THE LISTING TO THE VRD ADMINISTRATION OFFICE.
   41 - NOT READY FOR EMPLOYMENT
   42 - REFERRED TO VR FOR FUTHER SERVICES
   43 - NO LONGER WORKING AT FACILITY - COMPETITIVELY EMPLOYED
   44 - NO LONGER WORKING AT FACILITY

EMPLOYER	SSN	ID	NAME	CODE	ADDRESS	CITY	ZIP	ACCT
GOODWILL INDUSTRIES		03	NORMA	J	STEWART	MEDFORD	97501	4104
GOODWILL INDUSTRIES		02	NANCY	A	GRAND AVE	MEDFORD	97501	4104

Example #5

\E200 (L1)
DATE PROCESSED 12/03/81
REEL MCF 002133

VOCATIONAL REHABILITATION PROGRAM OFFICES
INELIGIBILITY DETERMINATIONS REVIEW
01/01/81-03/31/81

TA SUB DISTRICT V/IA

NAME	CLIENT NO CD	CURRENT STATUS	CLOSURE DATE	CURRENT COUNTY	CLOSING COUNSELOR	CONTACT DECISION	9-30 STATUS
		52	01 81	48	3109		
		52	01 81	48	2930		
		52	01 81	48	2961		
		52	01 81	48	2961		
		52	01 81	48	3088		
		52	01 81	48	2836		
		52	01 81	59	3029		
		52	01 81	48	2749		

Example #6

ICCUS-11 BY C 11 T CASE MOVEMENT EXCEPTION LISTING AND ACTION ITEMS

11/30/81

UNIT 01

CLIENT NO.	CLIENT NAME		STATUS	MONTHS IN	STD	VRC COUNSELOR	MESSAGE
537-	COLDIE	P	02	05	4	DARLENE	
574- -	NORMAN	R	02	06	4	DARLENE	
547- -	LARRY	L	02	05	4	DARLENE	
522- -	CHARLES	R	10	05	4	DARLENE	
557- -	HOWARD	S	10	07	4	DARLENE	
533- -	DONALD		10	09	4	DARLENE	
522- -	BENNIE	L	10	08	4	DARLENE	
465- -	BOBBY	C	10	09	4	DARLENE	
537- -	STEVE	B	10	11	4	DARLENE	
535- -	THOMAS	H	10	08	4	DARLENE	
535- -	GILMORE	F	10	08	4	DARLENE	
539- -	MICHAEL	A	10	07	4	DARLENE	
536- -	DAVID	L	10	10	4	DARLENE	
522- -	DAVID	A	10	11	4	DARLENE	
526- -	DAVID		10	10	4	DARLENE	
57.- -	JIMMY		10	05	4	DARLENE	
512- -	DONALD	B	10	05	4	DARLENE	
531- -	TOMMIE	H	10	06	4	DARLENE	
563- -	POLLY		10	08	4	DARLENE	
537- -	JAMES	E	10	11	4	DARLENE	
534- -	TRUDY	V	10	14		DARLENE	CLIENT PLAN EXPIRED 06/31
522- -	LEONARD		20	11	3	DARLENE	
501- -	ELMER	L	22	07	3	DARLENE	
534- -	ANITA	L	08	18		DARLENE	REVIEW CLOSURE TOO SEVERE
533- -	GARY	V	08	10		DARLENE	REVIEW CLOSURE TOO SEVERE
373- -	FRANCES	M	08	10		DARLENE	REVIEW CLOSURE TOO SEVERE
557- -	NORMAN		08	13		DARLENE	REVIEW CLOSURE TOO SEVERE
517- -	DANIEL	S	26	17		DARLENE	REVIEW CLOSURE TOO SEVERE
539- -	CYNTHIA	S	02	06	4	RICHARD	
1x6- -	GEORGE	H	02	05	4	RICHARD	
523- -	ROBERT	W	02	09	4	RICHARD	

Example #7

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52V EXCEPTION LIST AS OF 01/05/81 PAGE 01

DISTRICT NO. 100

CLIENT NAME		CLIENT NUMBER	COUNTY	REFERRAL DATE	DATE ENTERED CURRENT STATUS	DAYS IN CURRENT STATUS
CASES IN STATUS 02 120 DAYS OR MORE						
	R	B10000201847	SHELBY	07/08/80	07/08/80	181
	G	B10000201428	SHELBY	02/27/78	03/01/78	1,047
	B	B10000201838	SHELBY	06/17/80	06/17/80	202
		B10000201804	SHELBY	04/01/80	04/02/80	278
	P	B10000201705	SHELBY	08/21/79	08/21/79	502
	A	B10000201779	SHELBY	01/24/80	01/24/80	346
CASES IN STATUSES 00 & 02 182 DAYS OR MORE						
	G	B10000201428	SHELBY	02/27/78	03/01/78	1,042
	B	B10000201838	SHELBY	06/17/80	06/17/80	202
		B10000201804	SHELBY	04/01/80	04/02/80	279
	P	B10000201705	SHELBY	08/21/79	08/21/79	502
	A	B10000201779	SHELBY	01/24/80	01/24/80	346
CASES IN STATUS 10 182 DAYS OR MORE						
	L	B10000201696	SHELBY	08/02/79	10/01/79	461

Example #8

OKLAHOMA DEPARTMENT OF INSTITUTIONS, SOCIAL AND REHABILITATIVE SERVICES
PROGRAM NO. SR901 MESSAGE SHEET RUN DATE 11/01/81 PAGE NO. 32

AS OF 10/31/81 DESTINATION RVS-AUD AUDIT UNIT RVS STA OFF 00

MESS CODE	LV CD	CASE NUMBER		******CASE NAME*******	MESSAGE DESCRIPTION	
SR-F12 TO R237-27-				RICHARD R	ANNUAL REVIEW DUE	07/81
CSL-074		JAMES	FO=13	SUPV-18		FO=13
COORD-D		GEORGE	FO=01			FO=
SR-F12 TO R449-80-				EMMA J	ANNUAL REVIEW DUE	06/81
CSL-074		JAMES	FO=13	SUPV-18		FO=13
COORD-D		GEORGE	FO=01			FO=
SR-F12 TO R381-56-				CHARLES D	ANNUAL REVIEW DUE	06/81
CSL-074		JAMES	FO=13	SUPV-18		FO=13
COORD-D		GEORGE	FO=01			FO=
SR-F12 TO R443-66-				JIMMY L	ANNUAL REVIEW DUE	05/81
CSL-074		JAMES	FO=13	SUPV-18		FO=13
COORD-D		GEORGE	FO=01			FO=
SR-F12 TO R441-62-				JOE E	ANNUAL REVIEW DUE	07/81
CSL-074		JAMES	FO=13	SUPV-18		FO=13
COORD-D		GEORGE	FO=01			FO=
SR-F12 TO R440-60-				PATRICI A	ANNUAL REVIEW DUE	07/81
CSL-074		JAMES	FO=13	SUPV-18		FO=13
COORD-D		GEORGE	FO=01			FO=

Example #9

The purposes of the Case Aging Study in Michigan are to provide an inventory of all cases, to highlight cases that may be delayed in the process and to summarize caseloads by target groups. It also notes clients requiring annual reviews. A counselor's caseload is grouped by status and within each status, cases are arranged with the oldest case listed first. For each status group, cases that are overage are separated from cases that are not. In addition, there is a message column which can be used to indicate that a case has been in a status so long that the accuracy of the data is questionable.

The Texas Attention List contains the names of clients who have been in a particular status for a period of time which approaches or exceeds the average time for that status. The list includes the date a client was referred, the number of months since referral, the current status, the date on which the client entered that status, and the months in that status. One, two, or three asterisks alert the counselor to the length of time in status.

Fiscal and Accounting Procedures and Reports

Methods of allocating client service budgets vary from state to state, but many rehabilitation counselors have a budget with the authority to obligate federal and state funds. For these counselors, the management functions of controlling the purchase of services and having funds available are critical factors in the clients' rehabilitation.

To assist counselors and their supervisors control and properly expend the alloted money, some states have made the computer the major accounting and bookkeeping mechanism. This frees the counselors and secretaries from time consuming bookkeeping chores. Some states use the computer only to record expenditures, maintain them in accordance with federal accounting procedures, and meet R-300 and RSA-2 reporting requirements. Other states are accounting for encumbrances as well as expenditures for total computerized reporting.

The frequency of financial reports ranges from daily to monthly. On-line systems permit immediate call-up of encumbrances and expenditures, although files may only be updated daily. States create reports for counselors based upon counselor and supervisory needs, computer capabilities and time. The following reports demonstrate counselor-oriented reports and concerns.

The Oklahoma VR agency has installed an on-line system which permits a counselor to enter on a form displayed on the terminal a client number, a vendor number, and the services authorized. The computer then enters the remaining required information from the client and vendor files, assigns an authorization number, types the authorization and an invoice (claim) for the vendor and encumbers the funds. The counselor then signs the authorization (See Example 10). When the invoice is returned for payment, the encumbrance is reduced through the computer. Counselors receive monthly reports of all expenditures.

A counselor in Pennsylvania can secure a listing of his or her clients' unliquidated encumbrances to assist in purging outstanding encumbrances. The information provided is: client number and name, vendor number and name, authorization number, effective date of authorization, and balance (See p. 97).

To supplement this report, the counselor can secure an alphabetical listing of active clients' expenditure figures. It shows for each client the total unliquidated monies, and current fiscal year expenditures, further broken down by facility, trust fund and SSI costs incurred through the client's entire rehabilitation process (See p. 98).

The Cumulative Case-Service Expenditure Report - Detail Listing from Kentucky provides each counselor with the monthly expenditures processed. It is broken into four sections: non-severely disabled client expenditures, Section 110 severely disabled client expenditures, trust fund expenditures, and SSI expenditures. Within these categories, the following information is printed for each invoice: case number, client name, major disability, vendor number, authorization date, dates of service, expenditure category, original amount authorized, adjustments, net invoice and refunds (See Example 11).

12-10-81 STATE OF OKLAHOMA DEPARTMENT OF HUMAN SERVICES AUTHORIZATION NO. 127-234403

NON-MEDICAL SERVICES AUTHORIZATION KIND CASE SERVICE
CLIENT STATUS 18

ISSUE DATE 12-10-81

EFFECTIVE 12-10-81 FUND TRUST FUND
OTHER-SPEC.

ENDING

TO
UNIVERSITY OF OKLA
1000 ASP, ROOM 105
NORMAN
OKLAHOMA 73069

RE CLIENT RICHARD B
CASE NO.
COUNTY-CSLR.NO. 33-127
BOX 129
DUKE OK 73532

VENDOR IDENT. NO. 7992-36-6006
YOU ARE HEREBY AUTHORIZED TO FURNISH THE FOLLOWING SERVICES OR MERCHANDISE TO THE ABOVE-NAMED PERSON.

WE CANNOT BE RESPONSIBLE FOR ANY SERVICE NOT AUTHORIZED BY THIS AGENCY.

SERV. LINE	LIQUIDATION DESCRIPTION	DESCRIPTION OF SERVICES	SERV TYPE	PROC CODE	NO. UNITS	TYPE UNIT	UNIT COST	TOTAL COST
LINE 1		TUITION		015		HRS	.00	352.50
LINE 2		FEES					.00	70.00
LINE 3							.00	.00
LINE 4							.00	.00
						LESS FINANCIAL AIDS		.00
						AMT TOTAL		422.50

EXPLANATION SUPPLEMENTAL FALL 1981

ALL CLAIMS AGAINST THIS AUTHORIZATION MUST BE SUBMITTED WITHIN ONE YEAR OF THE DATE THE SERVICE OR ITEM IS PROVIDED.

SINCE THIS IS A STATE-FEDERAL AGENCY WE DO NOT PAY SALES TAX.

NOTE THE ABOVE ACCOUNT WILL BE PAID UPON RECEIPT OF INVOICE (FORM VR-A-305 OR VR-A-305A) ALL INVOICES SHOULD BE SUBMITED PROMPTLY WHEN DUE AND SHOULD BE PROPERLY EXECUTED BY THE BUSINESS MANAGER OR OTHER AUTHORIZED PERSON.

RETURN CLAIMS TO
REHABILITATIVE SERVICES, DISRS 20
555 E CONSTITUTION
ROOMS 112-113
NORMAN OK 73069

SIGNED
AUTHORIZED AGENT, VOCATIONAL REHABILITATION

ROUTING INFORMATION
SUPV CSLR HOME CSLR
DEE 20 NO 026 DEE 02 NO 127

COPY TO COUNSELOR VR-A-302

Example #10

KENTUCKY BUREAU OF REHABILITATION SERVICES - (ASCIS) PAGE 1

CUMULATIVE CASE-SERVICE EXPENDITURE REPORT FOR PERIOD ENDING 1/31/82

DETAIL LISTING

SEQ. NBR.	UNIT	CLIENT VENDOR	CLIENT NAME	MAJ DIS	S D	N P	VENDOR NUMBER	AUTH. DATE	PERIOD-OF-SERVICE BEGIN.	PERIOD-OF-SERVICE ENDING	SC	EXP CAT	ORIG AMT AUTH.	** ADJUSTMENTS ** INCREASE	** ADJUSTMENTS ** CANCELED	NET INVOICE	REFUNDS
0001	511	[illegible]		J	522	N	227124	10/01/81	10/01/81	1/01/82	11	10A	$22.50	$0.00	$0.00	$22.50	$0.00
0002	511	[illegible]		J	522	N	152431	10/01/81	10/01/81	1/01/82	11	10G	$100.00	$0.00	$0.00	$100.00	$0.00
0003	511	[illegible]		E	669	N	154403	10/09/81	10/09/81	1/09/82	11	10A	$22.50	$0.00	$0.00	$22.50	$0.00
0004	511	[illegible]		E	669	N	337608	10/09/81	10/09/81	1/09/82	11	10H	$41.25	$0.00	$0.00	$41.25	$0.00
0005	511	[illegible]		E	669	Y	143410	10/09/81	10/09/81	12/04/81	11	10H	$41.25	$0.00	$0.00	$41.25	$0.00
0006	511	[illegible]		M	611	N	114561	10/01/81	10/01/81	12/31/81	13	33C	$444.00	$0.00	$0.00	$444.00	$0.00
0007	511	[illegible]		D	522	N	336586	10/01/81	10/01/81	12/31/81	13	40A	$60.00	$0.00	$0.00	$60.00	$0.00
0008	511	[illegible]		M	599	N	510649	10/01/81	10/01/81	12/31/81	13	60B	$54.00	$0.00	$0.00	$54.00	$0.00
0009	511	[illegible]		D	614	N	227124	10/15/81	10/15/81	1/15/82	11	10A	$22.50	$0.00	$0.00	$22.50	$0.00
0010	511	[illegible]		D	614	N	152431	10/15/81	10/15/81	1/15/82	11	10G	$100.00	$0.00	$0.00	$100.00	$0.00
0013	511	[illegible]		M	599	N	510649	11/01/81	11/01/81	11/30/81	13	60B	$54.00	$0.00	$0.00	$54.00	$0.00
0014	511	[illegible]		D	522	N	336586	11/01/81	11/01/81	11/30/81	13	40A	$60.00	$0.00	$0.00	$60.00	$0.00
0016	511	[illegible]		M	520	N	115481	11/10/81	11/10/81	2/10/82	11	10A	$22.50	$0.00	$0.00	$22.50	$0.00
0018	511	[illegible]		D	550	N	115481	11/10/81	11/10/81	2/10/82	11	10A	$22.50	$0.00	$0.00	$22.50	$0.00
0019	511	[illegible]		D	550	N	112451	11/10/81	11/10/81	2/10/82	11	10G	$100.00	$0.00	$0.00	$100.00	$0.00
0023	511	[illegible]		M	599	N	510649	12/01/81	12/01/81	12/31/81	13	60B	$13.50	$0.00	$0.00	$13.50	$0.00
0024	511	[illegible]		D	522	N	336586	12/01/81	12/01/81	12/31/81	13	40A	$60.00	$0.00	$0.00	$60.00	$0.00
0035	511	[illegible]		M	599	N	115481	12/06/81	12/06/81	3/06/82	11	10A	$22.50	$0.00	$0.00	$22.50	$0.00
0036	511	[illegible]		D	522	N	336586	12/23/81	1/01/82	1/31/82	13	40A	$60.00	$0.00	$0.00	$60.00	$0.00
0039	511	[illegible]		J	524	N	113351	12/18/81	12/18/81	3/18/82	11	10A	$22.50	$0.00	$0.00	$22.50	$0.00
0040	511	[illegible]		J	147	N	135710	12/18/81	12/18/81	3/18/82	11	10G	$100.00	$0.00	$0.00	$100.00	$0.00
0041	511	[illegible]		M	579	N	295545	12/18/81	12/18/81	3/18/82	11	10A	$22.50	$0.00	$0.00	$22.50	$0.00
0042	511	[illegible]		M	599	N	137450	1/06/82	1/06/82	4/06/82	11	10E	$67.50	$0.00	$0.00	$67.50	$0.00
0050	511	[illegible]		M	649	N	150367	1/18/82	1/18/82	4/18/82	11	10H	$60.00	$0.00	$0.00	$60.00	$0.00
		EXPENDITURE CODE SUB-TOTALS 01					NON-50 EXPENDITURES				*		$1595.50	$0.00	$0.00	$1595.50	$0.00

Example #11

The Cumulative Case Service Expenditure Report - Summarized Totals accompanies the above report. It summarizes net expenditures from 110 funds for severely and non-severely disabled, trust fund, and SSI, plus the total of all expenses, and net total for severely disabled, and percent spent on severely disabled. For each of these funds, expenditures are broken down by service status (02, 06, 10-24, post-employment), by category of service (diagnostic and evaluation, maintenance, etc.), special use of funds, adjustments, refunds, and facility use (See Example 12).

In Texas, the counselors are provided a Transaction Listing - No Activity Ninety or More Days report. This quarterly report lists outstanding encumbrances against which no action has been taken for 90 days. If there have been partial payments or refunds against these authorizations, they are shown. Also provided are requisition number, client, dates of service, transaction amount, balance and vendor identification.

Each counselor in Arkansas receives a weekly printout of the life-of-case financial transactions for each client. The transactions are identified as encumbrances or expenditures. For each client the summary shows all encumbrances by vendor, each payment to a vendor, and a vendor summary. Costs are broken down by facility, trust fund, SSI, extended evaluation and total costs. The client's total program and current fiscal year costs are also displayed. At the end of the report, the counselor's weekly and year-to-date activities are summarized by encumbered, cancelled, net encumbered, paid, outstanding allotment, and allotment balance. The report also provides some client information.

The Nevada Rehabilitation Division produces an Outstanding Authorizations report for each unit. It lists, by client, all outstanding authorizations, when they were issued, amount, balance, and the number of days they have been outstanding (See Example 13).

A counselor in Pennsylvania can call up a visual record of all costs incurred for a specific client throughout the entire rehabilitation program. The report contains for each expenditure the originating district office, fee schedule number, authorization number, date, supplier number, type of service code, fund code, authorized amount, adjustments, open encumbrances remaining, vendor ID number, invoice number, date, period of service, invoice amount, necessary accounting codes, and fiscal year in which invoice was paid.

The Oklahoma Client Service Expenditures Report separates expenditures for each client into medical, non-medical, and payments to clients by vendor and authorization number and date (See Example 14).

Information Exchange and Resource Directories

Vocational rehabilitation agencies purchase services from private vendors and secure similar benefits through other agencies. A counselor's success frequently depends on his or her knowledge of available services or benefits, and the ease of securing necessary information about the vendors or agencies. Vendor or agency information traditionally has been manually maintained or verbally communicated. Some states are beginning to place this information in their computers or word processers. Umbrella agencies with centralized client computer files may share client information or indicate what agencies are serving a particular client. These procedures could allow for more comprehensive, less expensive services to all clients.

The Supplier Master Display used in Pennsylvania contains all available information on each vendor, including notification that a vendor no longer wishes to be used by VR. Provided are the vendor identifiers, codes for the services they provide, and the total payments made to the vendor (See p. 99).

Pennsylvania counselors have access through a terminal to the most current vendor file. When an individual is unsure of the vendor's name, the file can display all the vendor names identical to that requested if provided a minimum of the first three letters in the vendor's name. When located, the vendor's name, address and number are displayed (See p. 100).

SD020H 02/05/82 KENTUCKY BUREAU OF REHABILITATION SERVICES - (ASCIS) PAGE 3

FY - 82 QT - 2 CUMULATIVE CASE-SERVICE EXPENDITURE REPORT FOR PERIOD ENDING 1/31/82

CASELOAD : 011701 SUMMARIZED TOTALS

		TOTAL TRANS	(BASIC SUPPORT - SECT. 110) NET EXPENSE	FOR S. D.	%	(TRUST FUND) NET EXPENSE	(S. S. I.) NET EXPENSE	(TOTAL: ALL FUNDS COMBINED) NET EXPENSE	FOR S. D.	%
I. GRAND TOTAL	=	59	$2944.07	$1132.52	38	$0.00	$0.00	$2944.07	$1132.52	38
A. BY SERVICE-CODE:										
1. (STATUS 01)	11 =	27	$1320.90	$314.65	24	$0.00	$0.00	$1320.90	$314.65	24
2. (STATUS 09)	12 =	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
3. (STATUS 10-26)	13 =	12	$1623.17	$817.87	50	$0.00	$0.00	$1623.17	$817.87	50
4. (POST-EMPLOYMENT)	14 =	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
B. BY CATEGORY OF SERVICE										
1. DIAG & EVAL	10 =	28	$1343.60	$337.15	25	$0.00	$0.00	$1343.60	$337.15	25
2. RESTORE: SURGERY	21 =	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
PROST APPL	22 =	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
HOSP & CONV	23 =	1	$217.95	$217.95	100	$0.00	$0.00	$217.95	$217.95	100
OTHER	24 =	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
3. TRAINING: ACADEMIC	31 =	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
OTHER ACAD	32 =	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
BUSINESS	33 =	5	$644.00	$0.00	0	$0.00	$0.00	$644.00	$0.00	0
TRADES	34 =	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
10. OTHER	35 =	1	$536.00	$536.00	100	$0.00	$0.00	$536.00	$536.00	100
11. RTW ADJUST	36 =	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
12. TECH ASSOC	37 =	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
15. MISC	36 =	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
16. MAINTENANCE	40 =	4	$240.00	$0.00	0	$0.00	$0.00	$240.00	$0.00	0
18. FAMILY	50 =	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
19. TRANSPORTATION	60 =	4	$162.72	$41.22	25	$0.00	$0.00	$162.72	$41.22	25
17. OTHER	90 =	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
C. 110 FOR SSI ESSYS): TOTAL	=	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
D. 110 FOR DI (35YS): TOTAL	=	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
E. SPECIAL PROJECTS ( )	=	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
F. (NON-MMY) RECORDS	=	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
G. ADJUSTMENTS: INCREASES	=	3	$84.85	$84.85	100	$0.00	$0.00	$84.85	$84.85	100
CANCELLATIONS	=	1	$43.78	$43.78	100	$0.00	$0.00	$43.78	$43.78	100
H. REFUNDS	=	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
I. EXPEC POST-PAID (TOTAL)	=	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
1. IN LIEU OF SSI (5595)	=	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
2. IN LIEU OF TF (5598)	=	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
J. 1YR-FU POST-PAID (TOTAL)	=	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
1. IN LIEU OF SSI (5595)	=	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
2. IN LIEU OF TF (5598)	=	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0
K. FAC. UTILIZED: (NONE)	=	0	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	0

Example #12

REPORT NR. VR110
RUN 12/04/81

BUREAU OF VOCATIONAL REHABILITATION

PAGE 21
FISCAL YEAR OCT 81 THRU JUN 82

OUTSTANDING AUTHORIZATIONS

SNMH

CNSLR	CLIENT	NAME		FUND	AUTH NR	BRNL	AUTH SERVICE DATE	ORIGINAL AUTH AMT	AUTH ADJUST (+) (-)	BILL AMT	AUTH BAL	AGING AUTH
62	03770310		*	1	11213	0001	10-07-81	21.30			21.30	58 DAYS
62	03780490		*	1	11207	0008	12-11-81	34.00			34.00	
62				1	11209	0007	11-16-81	48.90			48.90	
62	22790014		*	1	10599	0010	11-18-31	60.00			60.00	
62				1	11210	0019	11-24-81	124.50			124.50	
62				1	11212	0019	10-27-81	11.20			11.20	38 DAYS
62				1	11217	0020	12-01-81	60.50			60.50	
67	22790074		*	1	11205	0002	01-31-82	300.00			300.00	
67	22800115		*	1	10574	0001	12-31-81	186.00			186.00	
62	22400120		*	1	10593	0001	12-31-81	106.00			106.00	
62	22900125		*	1	10575	0001 0003	12-31-81	370.00	130.00-		370.00 240.00	
62				1	10576	0002 0004	12-31-81 12-04-81	280.00		70.00	240.00 210.00	34 DAYS

Example #13

TO - R.S. NO. 99, OKLAHOMA CITY COUNSELOR - 123 RUN DATE - XX/XX/XX
JOE B. DOE, COUNSELOR
FROM - L.E. RADER, DIRECTOR DEPARTMENT OF HUMAN SERVICES PAGE - 01

CLIENT SERVICE EXPENDITURES FOR XX/XX/XX THRU XX/XX/XX

CASE IDENTIFICATION NAME - LAST F M NUMBER	VENDOR IDENTIFICATION NAME	AUTHORIZATION NUMBER	AUTHORIZATION DATE ISSUED	PATIENT INFORMATION CLAIM NO.	PATIENT INFORMATION DATE PAID	PATIENT INFORMATION AMOUNT
PART I - MEDICAL EXPENDITURES						
P J	TURNER JAMES MD	016915702	06/06/79	647763	08/24/79	99,999.99
R W	GRUBB WILLIAM R	016915602	06/05/79	655197	08/24/79	37.00
C H	DOTTER RICHARD G	016916501	06/13/79	664411	08/14/79	50.00
J R	PROSSER M P	016921802	06/20/79	620795	08/07/79	10.00
**********						
PART II - NON-MEDICAL EXPENDITURES						
A - MONTHLY DIRECT EXPENDITURES TO CLIENTS						
R E	ALEXANDER R E	850123	08/01/79	123456	08/02/79	90.00
J J	ROBERTS J J	850125	08/01/79	134567	08/27/79	44.00
D G	ROGERS D G	950123	06/01/79	124651	08/13/79	45.00
B - OTHER NON-MEDICAL EXPENDITURES						
E O	CAPITOL BARBER COLL	900123	01/01/79	425123	08/10/79	150.00
R T	UNIV OF OKLAHOMA	016915001	07/01/79	425125	08/11/79	157.50

END OF REPORT

Example #14

27

Department of Welfare and vocational rehabilitation client tapes in Texas are cross-matched and a report is provided to the counselor when a match is made. The report gives the client's address, welfare case number, worker, type of public assistance, eligibility date, and amount of assistance. The counselor also is informed how the client is coded for public assistance in the VR file (See Example 15).

The Florida Client Registration Report lists all a counselor's clients and indicates what other agency in the umbrella serves the client. To secure more detailed information, the VR counselor simply asks for the other worker's name and contact is made.

Oregon prepares several reports concerning SSI and SSDI recipients. A caseload report lists all allowed SSI or SSDI cases by counselor, showing current VR status, status of verification from SSA and certification. Another report (See Example 16) lists by counselor, cases verified but not certified by SSA to be receiving SSDI or SSI. The computer generates cards to send to SSA to request verification and to report closures. Another report lists all cases referred by Disability Determination but not opened by VR within 60 days. A Chargeable Expenditures Report lists all SSI and SSDI cases served in the current fiscal year, identifying paid bills as chargeable or not chargeable to SSA according to the verification or certification information on file.

Under a contract with the Migrant Student Record Transfer System (MSRTS), based in Little Rock, Arkansas, fifteen state rehabilitation agencies are sharing information on migrant workers through participation in the Virginia Interstate Migrant Farmworker Rehabilitation Project. When a migrant comes to a participating VR agency, the counselor calls MSRTS. The counselor can ascertain if the migrant is being or has been served by any other state, the current status, primary and secondary disability, and the name, address and phone number of the most recent counselor. This computer-based system enables the coordination and continuation of services to a population whose vocation requires frequent moves.

Technology For Clients

The computer or the microprocessor is widely used in devices which enhance the lives of handicapped people in the home and at work. There are also the computer-related occupations so well suited for mobility-impaired people. However, the use of the computer for or by clients to expedite the rehabilitation process is still extremely limited. Most of the client-related technology is external to the VR system and must be purchased on a contractual or per-client basis, or shared with other human service agencies.

One in-house aid is the Oklahoma Potential Client Change Analysis. This report is generated by a computer program which extracts from the client files information that has been found to influence clients' progress from acceptance to closure. The program identifies this information for a particular client and searches through the data bank to provide a summary of the agency's experience in working with clients with similar characteristics. The report contains the client's current condition and shows the probability of that client improving on the following factors: economic/vocational status, physical functioning, psycho/social functioning, family relationships, and education. These probabilities can be used to assist the client and counselor in establishi ng realistic objectives. They may also be useful in providing guidelines for program content, time allocations by client and counselor, money expenditures, and for optimizing program effectiveness (See Example 17).

The West Virginia agency operates a statewide Information and Referral Hotline for blind and visually handicapped persons seeking information about services available to them. A person calling the toll-free hotline will receive information about services available from state and federal government agencies, and from private organizations. The caller will receive the address and telephone number of the appropriate service provider(s) and, upon request by the caller, the unit also may serve as an intermediary between the caller and service provider. A minicomputer provides ready access to information about services and also processes all the paperwork required to refer a caller to the appropriate agencies or organizations.

```
PGM-ID = S52202 (SW6=0)                    TEXAS REHABILITATION COMMISSION          39000000                    PAGE    5
INPUT FILE: ST2201                    WELFARE CASELOAD CROSSMATCH OF NEW RECIPIENTS
                                                JULY 23, 1981                                                  EOM #  06
                    THESE CLIENTS HAVE BEEN UPDATED ON YOUR CASELOAD - PLEASE CORRECT IF IN ERROR
REGION 7
SUPERVISOR 959                                          SUPV-OFFICE NAME: BEAUMONT CALDER F O-TRC/O
COUNSELOR  424                                          COUN-OFFICE NAME: PORT ARTHUR F O-TRC/DHR P

      SS NO.          CLIENT NAME                STATUS    STATUS DATE   REFERRAL DATE   BIRTH DATE   TRC MEDIC NO   PA TYPE
   ***********  ***************************     ******   ***********   ************   **********   ************   *******
                                                  20      05/06/81       01/22/81      09/03/54    5-008219-68

DPW INFORMATION
NAME:                                ADDRESS:      CARVER TERRACE                                PORT ARTHUR      TX 77640
CASE-NO: 5-008219-68      PROG. TYPE: 01      DPW OFFICE NO:                  BUDGET-JOB NO:  1061/A01
PA TYPE: AFDC          GRANT AMOUNT: $118  ACCEPTANCE DATE: 06-09-81          BIRTH DATE:  09-03-54

TRC GENERATED MESSAGES:
        -- CLIENT PREVIOUSLY IDENTIFIED BY TRC AS PA CODE 0                                          --------- NOTE ---------

   ***********  ***************************     ******   ***********   ************   **********   ************   *******
                                                  18      03/18/81       01/22/81      12/14/61    5-016555-20

DPW INFORMATION
NAME:                                ADDRESS:      EAST 15TH ST                                  PORT ARTHUR      TX 77640
CASE-NO: 5-016555-20      PROG. TYPE: 01      DPW OFFICE NO:                  BUDGET-JOB NO:  1061/A01
PA TYPE: AFDC          GRANT AMOUNT: $118  ACCEPTANCE DATE: 06-25-81          BIRTH DATE:  12-14-61

TRC GENERATED MESSAGES:
        -- CLIENT PREVIOUSLY IDENTIFIED BY TRC AS PA CODE 0                                          --------- NOTE ---------

   ***********  ***************************     ******   ***********   ************   **********   ************   *******
                                                  18      03/17/81       07/24/80      05/07/51    2-245768-01

DPW INFORMATION
NAME:                                ADDRESS:      MOBILE AVE                                    PORT ARTHUR      TX 77640
CASE-NO: 2-245768-01      PROG. TYPE: 01      DPW OFFICE NO:                  BUDGET-JOB NO:  1061/A01
PA TYPE: AFDC          GRANT AMOUNT: $164  ACCEPTANCE DATE: 06-30-81          BIRTH DATE:  05-07-51

TRC GENERATED MESSAGES:
        -- CLIENT PREVIOUSLY IDENTIFIED BY TRC AS PA CODE 0                                          --------- NOTE ---------
```

Example #15

1/13/82 LIST OF SSDI-SSI CASES SERVED SINCE OCT 1,1980 PAGE
VERIFIED BUT NOT YET CERTIFIED BY R-13

ACCT	SSN	FNAME	NAME	PLANDTE	STATUS	STATUS DATE	SSDI ALLOW	SSDI TERM	SSI ALLOW	SSI TERM	EARN
0801		RHONDA		102681	14	102681	010177				
0801		SUSAN		041681	28	080681	030165				000
0801		KELLY		110681	18	110681			020181		
0801		PHILLIP		091881	18	091881	030168				
0802		ROY		110181	26	010582	060181				070
0802		CECIL		060881	18	060881	010181				
0802		STEVEN		013080	28	062581	090180	090180	070180	030181	000
0802		PHYLLIS		021181	26	010682	030179				075
0802		RAMON		071381	18	071381	090177				
0802		KENNETH		062381	28	112481	120173				139
0802		ROBERT		080381	26	103081			090180		033
0802		MARK		030281	26	052981	070173				080
0803		SHIRLEY		022581	28	101481	040179	110180	010181	010181	000
0803		ALLEN		012781	22	102281			120180	120880	
0803		ORVAL		022481	20	100981	010180	010180	110180		
0803		TIMOTHY		031881	26	111781	100178		020181	020181	050
0805		ROGER		090380	28	060981	020177	090180			000
0805		CAROL		041878	26	042881	050175	110176			128
0806		BETTY		100881	14	100881			090180	999999	
0806		ARLENE		120181	18	120181	120175				
0806		MARY		090481	18	090481	010175				

OFFICE TOTAL

Example #16

RVS AUDIT

CLIENT NAME :
SOCIAL SECURITY NO. :
ADDRESS : OKLAHOMA CITY OK 73117
TELEPHONE NUMBER :

DISABILITY : MR MILD FSIQ 53
DISABILITY CODE : 530

CASE NUMBER : 446582930
DISTRICT OFFICE : 31
COUNTY : 55
COUNSELOR NAME :
CASELOAD NUMBER : 504

POTENTIAL CLIENT CHANGE ANALYSIS

THE FOLLOWING PREDICTIONS FOR YOUR CLIENT ARE BASED ON AGENCY EXPERIENCE WITH SIMILAR CLIENTS OVER THE PAST SEVERAL YEARS. THESE PREDICTIONS ARE OF THE SAME NATURE AS THOSE MADE BY WEATHER FORECASTERS - THEY ARE PROBABILITIES

THESE PREDICTIONS MAY BE USED ON THE FOLLOWING WAYS:
1. TO ASSIST YOUR CLIENT IN ESTABLISHING REALISTIC OBJECTIVES.
2. TO ASSIST YOU, THE COUNSELOR, IN FORMULATING REALISTIC OBJECTIVES FOR YOUR CLIENT.
3. TO PROVIDE GUIDELINES FOR A.) PROGRAM CONTENT B.) TIME EXPENDITURES BY CLIENT AND COUNSELOR C.) MONEY EXPENDITURES IN ORDER TO OPTIMIZE PROGRAM EFFECTIVENESS.

PROBABILITIES OF MOVING FROM CURRENT STATUS TO LISTED STATUS AT CLOSURE

		FUTURE STATUS				
FACTOR	CURRENT STATUS	1	2	3	4	5
ECONOMIC/VOCATIONAL STATUS	5	2.9	22.9	17.1	25.7	31.4
PHYSICAL FUNCTIONING	2	37.5	57.1	1.8	1.8	1.8
PSYCHO/SOCIAL FUNCTIONING	2	46.2	23.1	15.4	7.7	7.7
FAMILY RELATIONSHIPS	1	78.0	14.0	6.0	1.0	1.0
EDUCATION	3	2.7	13.5	77.0	5.4	1.4

Example #17

The South Carolina Handicapped Services Information System is a multi-agency system which provides on-line information on available services for handicapped persons. The client indicates the county and the service for which information is desired. Within four seconds, information regarding the available service will be displayed on the terminal, including the agency providing the service, its location and phone number. Also provided are a detailed description of the service, eligibility criteria, availability of transportation, hours of operation, and accessibility. If a service is not available in a particular county, the system will display the name of the nearest county where the service is provided.

The greatest use of the computer by VR for clients is in the area of occupational information. In 1970, the Department of Labor awarded grants to eight states to develop computer-based information and guidance systems for students and out-of-school youth. From these efforts life-long career information systems evolved. In 1976, the National Occupational Information Coordinating Committee (NOICC) was formed to consolidate the efforts of all the states to insure uniform definitions and standardized occupational classifications. Each state has a counterpart of NOICC - the State Occupational Information Coordinating Committee (SOICC). Each state committee must, at a minimum, consist of representatives from vocational education, employment security, employment and training (CETA), and vocational rehabilitation.

There are also a number of privately developed occupational and career information systems available. Table 1 summarizes a few of the systems in use, and a listing of other systems can be found in Appendix B. Appendix B also contains a printout of a conversation between the North Carolina Career Information Delivery System computer and a client, and a sample occupational brief.

The National Rehabilitation Information Center (NARIC) was established in 1977 to improve information dissemination to disabled persons and to rehabilitation professionals, and is funded by the National Institute of Handicapped Research. NARIC uses computers to collect, store and retrieve information from rehabilitation literature. The intended scope of its collections covers the totality of the rehabilitation field's disciplines, professions and services.

NARIC, in conjunction with the Rehabilitation Equipment Demonstration Units, Rehabilitation Engineering Centers, the California Department of Rehabilitation, and the Rehabilitation Engineering Service Delivery Project, has developed a computerized file of adaptive devices and equipment for handicapped individuals called ABLEDATA. Presently, the ABLEDATA computerized collection is available only through a limited number of agencies. These agencies act as "brokers" for dissemination of the information by providing interpretation of questions and answers, and identifying local resources. The ABLEDATA data bank currently contains approximately 1,000 entries of personal care and home management products, and is in the process of adding another 6,000 rehabilitation products. ABLEDATA provides name, address, cost of products, catalog descriptions, user feedback and comments from professionals. In the future, evaluation data and suggestions for custom equipment designs, or custom modifications to commercial products will be included (*Pathfinder*, 1980).

Technology For Support Services

Statistical and Report Writing Packages

Staff need no longer be restricted to routine reports or information. Software companies are producing report writing and statistical packages which permit staff with limited training to access information and produce their own one-time reports. Because these packages use English-type input, the requests take a comparatively long time to run and thus are more costly than the routine agency reports. The packages, however, provide flexibility and greater access to stored information. If information is needed on a one-time basis, it is less costly to secure through this type of system than to develop your own program. In the states which utilize one or more statistical packages, the central office fills the counselor's request; counselors as yet do not have this capability.

The following are some of the frequently used statistical and report writing packages:

NAME	FUNCTION	TOPICS	DATA FILES	ADAPTATIONS
CHOICES	Interactive in a conversational mode. Client can ask questions about a specific occupation or explore interests. Can compare 2 or 3 occupations at a time.	Interests Aptitudes, Temperaments Conditions, Employment Outlooks, Salary, Physical Demands, Training Requirements, Similar Occupations	Occupational, Educational/ Training Institutions (States have added other files)	N.C., Fla.
CIS (Career Information System) (Occupational Information Systems OIS)	Interactive system using direct approach or a structured access strategy called QUEST.	Temperament, Interest, Education, Physical Demands, Work Settings, Earnings	Occupational Descriptions Bibliography Visit (contacts) Clubs (career exploratory clubs) Preparation-needed skills and licensing Colleges Financial Aid Local Summer Jobs	Oregon Alaska California Colorado Georgia Hawaii Iowa Massachusetts Minnesota Nebraska Washington
COIN (Coordinated Occupational Information Network)	Interactive guidance system which allows the user to create an occupational profile by indicating topics of interest. Can use with direct access of occupations. Also incorporates cross-walks among files including references to microfiche.	Interests, Working Conditions, Career Clusters, Education, Physical Strength and Demands, Salary.	Occupational, College Majors, Colleges, Apprentice Tips, Military, School Subject, Others May Be Added.	South Carolina
DISCOVER	A computerized systematic career guidance system at two levels - high school and college/adult with components addressing self-information (values, interests, competency), exploration of occupations, decision-making practice, relationship of self-information to occupations, information to assist in decisions.	Three Major Categories: 1. Values and Decision Making Education 2. Relating and Exploring Opportunities 3. Career Planning	Occupations, Colleges, Technical Schools, Apprenticeships, Military Training, Graduate and Professional Schools, Others May Be Added.	Illinois Vermont Florida (School Systems)

TABLE 1

MAJOR CAREER INFORMATION SYSTEMS

(Additional information is available in Career Information Delivery System Feasibility Study for the State of Illinois, Oct. 1980 - Ralph, Jacobson, Grabowski)

DEL. DVR : SPSS-FREQ-001 : ALL CASES YEAR TO DATE 10/07/81 PAGE 14

FILE SYSFILE (CREATION DATE = 10/07/81) INPUT IS EOM SEPTEMBER, 1981

EDUC YEARS OF EDUCATION

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0	377	8	8	7	120	3	15	14	149	3	90
1	9	0	8	8	304	7	22	15	46	1	91
2	16	0	9	9	397	9	31	16	79	2	93
3	29	1	9	10	451	10	40	17	13	0	93
4	42	1	10	11	436	10	50	18	11	0	94
5	36	1	11	12	1537	34	84	20	1	0	94
6	67	1	13	13	154	3	87	99	291	6	100

MEAN	15.501	STD ERR	0.327	MEDIAN	11.497
MODE	12.000	STD DEV	22.103	VARIANCE	488.541
KURTOSIS	10.027	SKEWNESS	3.395	RANGE	99.000
MINIMUM	0.000	MAXIMUM	99.000		

VALID CASES 4565 MISSING CASES 0

Example #18-A

DEL. DVR : SPSS-FREQ-001 : ALL CASES YEAR TO DATE 10/07/81 PAGE 10

FILE SYSFILE (CREATION DATE = 10/07/81) INPUT IS EOM SEPTEMBER, 1981

SEX

CATEGORY LABEL	CODE	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY (PERCENT)	ADJUSTED FREQUENCY (PERCENT)	CUMULATIVE ADJ FREQ (PERCENT)
	1	2294	50.3	50.3	50.3
	2	2271	49.7	49.7	100.0
	TOTAL	4565	100.0	100.0	

MEAN	1.497	STD ERR	0.007	MEDIAN	1.495
MODE	1.000	STD DEV	0.500	VARIANCE	0.250
KURTOSIS	-2.001	SKEWNESS	0.010	RANGE	1.000
MINIMUM	1.000	MAXIMUM	2.000		

VALID CASES 4565 MISSING CASES 0

Example #18-B

Statistical Packages	Report Writers
SPSS	CULPRIT
S A S	EASYTRIEVE
BMPD	RAMIX
S C S S	REPORTER
SIBLY-RUNNER	MARK IV
MINITAB	ASSIST
OMNITAB	
SOS	
STATPACK	
OSIRIS	
DATATEXT	

Delaware uses SPSS and Example 18 contain two compilations available on that system.

Microfiche

Microfiche reduces up to 224 pages of computer printout information onto one 4 x 5 ½ inch sheet of microfilm at a cost comparable to the computer printouts. Information that was once too voluminous to reproduce and distribute can be made available quickly and inexpensively. Computer tapes can be converted directly to microfiche. Thus, listings of vendors, medical specialists, occupational information, and clients can be extensively distributed and easily stored. The attachment of a printer to the microfiche reader makes hard copies of specific information quickly available, expanding the usefulness of the microfiche.

Word Processing

Agencies are increasing the use of word processors as their applications expand and storage and computer capabilities become more sophisticated. Word processors are being used for publications, report writing, client surveys, and production of frequently changing lists. The Nebraska Disability Determination Section uses a word processor for authorizing services. An examiner can input a client number, counselor number, vendor number, and code for type of report desired. The processor finds the client's name and address, types a letter indicating that the client is to go to a designated vendor for service, and signs the counselor's name.

The Oregon agency uses a word processor for tracking of resources committed to implementation of identified policy issues (See Appendix C).

Teledyx

To speed up the receipt of medical reports, the Nebraska Disability Determination Section is using a teledyx system. Physicians are provided a toll-free 800 phone number which is connected to a telerecorder. The physicians dictate their reports over the phone. The recordings then are transferred to cassette tapes which are transcribed by DDS secretaries and returned to the physicians for corrections and/or signatures.

Impact On Staff

The introduction of data processing and automated management systems have added to, rather than changed field unit staff roles. The availability of management information certainly provides additional information to the unit supervisor which may change the methods of supervision. It probably does not make the supervisory function easier but perhaps makes possible more comprehensive supervision.

At this stage of development and with the emphasis on management, most counselors view automated data systems as an additional responsibility. The collecting and reporting of information can and have been chores from which no major benefits are perceived — many counselors get nothing more useful to them than a listing of clients. Although many states are becoming skilled in manipulating data to provide useful information to counselors, there is room for improvement and for innovative thinking. In the meantime, counselors collect information and ensure it is entered into the system.

Secretaries and other clerical staff are undergoing some changes to their functions as well. Data processing forms require coding and frequently this is left to the clerical staff. Secretaries all too frequently are the exclusive guardians or maintainers of the data systems. The development and use of word processors will have a tremendous impact on some secretaries - it is already doing so on a limited basis.

Until recently, vocational rehabilitation field offices usually consisted of the supervisor, counselor, and clerical staff. With the advent of computer terminals in the units, the task of inputting data can be assigned to current staff or to a new position, that of a data input or data console operator.

Technology as applied to service delivery is still in its infancy. Those agencies with on-line computer systems providing ad-hoc reporting or report call-up are serving the counselors with increasing effectiveness. Access to accurate and current information is essential to the counselor, permitting effective use of time and improved decision making. Data banks and computer programs are being devised and used to enhance clients' perceptions of work and their capabilities. Clients can better determine their goals and objectives through the use of technology.

Applying technology to service delivery is limited not by the technology, but rather by the lack of resources and imagination. The next two chapters will look at applications that are possible using today's technology.

References

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Chapter 3

Potential Applications In Rehabilitation Service Delivery

In the previous chapter, the current uses of computers by state vocational rehabilitation agencies to improve the delivery of services to clients were discussed. There are many other computer applications in use outside of rehabilitation. This chapter focuses on how some of these may be adapted for use by vocational rehabilitation. They are grouped as:

- electronic mail
- computerized data banks
- computer based education
- distributed data processing
- decision support systems

Electronic Mail

While electronic mail does not have one universally accepted meaning, most often it refers to the delivery by electronic means of messages that otherwise would be transmitted by paper or verbally (Saxton and Edwards, 1980).

Electronic mail is not a new development born of space age technology. It originated in 1844 when Baltimore and Washington, DC were linked by the first telegraph line. For years, the telegraph was relegated to second rate status by the telephone. Today we are finding that electronic communication can at times offer advantages over telephone service.

During the 1970s four advancements in electronic technology contributed to the increased use and development of electronic mail systems: networking capabilities, low-cost terminals, large organizations requiring improved communications and the increased speed of communication.

While public frustration continues over the U.S. Postal Service, and business telephone service becomes increasingly expensive, electronic mail offers several advantages:

1. Electronic mail is distinguished from other forms of communication by its capability for non-simultaneous communication, i.e., the sending and receiving parties do not have to be in communication at the same time. Messages once received can be stored (electronic mailbox) and either forwarded or retrieved at a more convenient time.

2. As outgoing telephone calls typically fail to reach the person sought 75 percent of the time, non-simultaneous communication increases efficiency and can improve worker effectiveness through better time management (Brown, 1981).

3. Electronic mail is an alternative for expensive business travel.

4. It does not rely only on audio communication, making it more appropriate for communicating with the hearing-impaired.

5. Electronic mail is more effective for communicating numerical and technical information (Annenberg, 1978).

Electronic mail products generally are categorized into document distribution systems, computer message systems and conferencing systems.

1. **Document distribution systems** combine the use of paper with the electronic message distribution function. Telex-TWX and facsimile transmission are the two primary examples of a document distribution system.

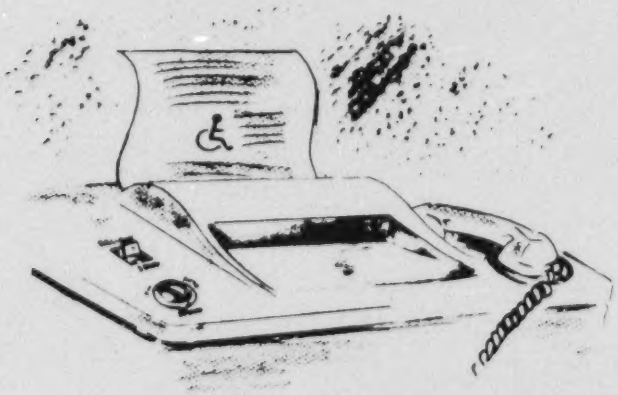
Telex-TWX is a worldwide communications network of teleprinters offered by Western Union in cooperation with the U.S. Postal Service, culminating in a mailgram. Telex was established in 1958 and is used heavily by businesses operating in widely dispersed geographical areas. One advantage of Telex is its ability to send the same message to a large number of recipients quickly and in a predictable time frame.

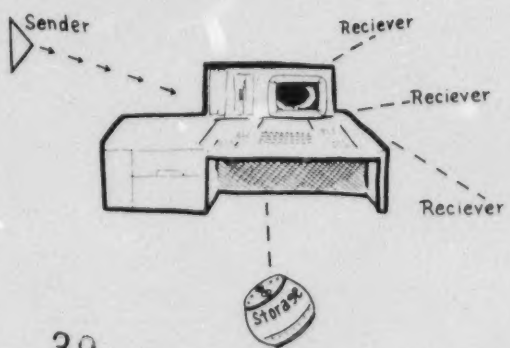
In facsimile transmission, a document is scanned at the sending station and a copy transmitted by radio wave or telephone lines to a receiving station in a matter of minutes. Because facsimile sends an exact copy, it is useful for transmission of graphs, charts, pictures and handwritten documents. The limitations of this form of electronic mail are: 1) all stations must have facsimile equipment to send or receive copies; and, 2) high long distance phone costs may be incurred.

The Department of Veterans Benefits of the Veterans Administration uses facsimile equipment to route changes in policies and procedures quickly to staff in 57 regional offices. The VA has found that the use of facsimile transmission provides more time for analysis of complex issues, assures an accurate response and generally facilitates the communication of information required to assist veterans (Veterans Administration, 1979).

Generally, it is not profitable to send a large volume of documents by electronic mail but such a network could assist a rehabilitation agency by transmitting important documents which need to be shared quickly, even if handwritten. Other possible rehabilitation applications are: to facilitate coordination and cooperation between central and field offices, for administrative reviews, client assistance projects or inquiries from clients, and the sharing of job leads among field offices.

2. **Computer message systems** are the fastest growing category of electronic mail. This category includes not just one, but a variety of terminal-oriented systems that use a computer for receiving, storing and transmitting messages.





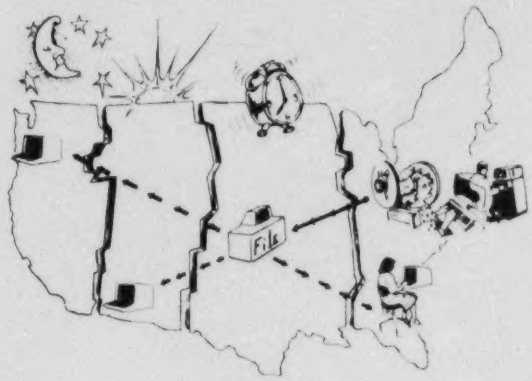
39

A number of computer companies offer message systems where the company provides the computer terminals and basic training for users. Users dial into the network to transmit or receive messages, and costs are based on the number of transactions. This is an inexpensive way to try electronic mail without purchasing equipment.

Owens-Corning Fiberglass of Toledo, Ohio began leasing computer message services in 1979 on a pilot basis to assist in internal communications. The company markets a variety of products internationally and intra-company communications are complex. Owens-Corning used the system primarily to replace lengthy telephone calls and short memos, alter existing communication procedures and to communicate in ways not possible previously. Traditional communication methods were altered when sales people were able to report information wherever and whenever it was convenient for them. Geographically-dispersed personnel were able to review and comment on complex documents. Owens-Corning estimates that 25 cents were saved every time a computer message transaction replaced a traditional communication transaction, and a savings of $4.35 per message in employee time (Cannings, 18).

Manufacturers of word processing equipment are producing intelligent computer terminals capable of combining data received over communications lines with text from a word processing center (Cannings, 15). Communicating word processors have the capability of exchanging text with other communicating word processors. Transmission typically takes place over telephone lines and may be controlled by or linked to a computer. All documents transmitted by word processors must be typed, but creating and editing the documents are simplified by the word processing capabilities. Although a large number of word processors are available today, only a small percentage have this communications capability. There are no standards for communications and compatibility of equipment is a problem.

3. **Computer conferencing systems** comprise the third category of electronic mail. They can be described as a kind of super computer messaging system (Cannings, 19). Computer conferencing systems make it possible for people dispersed over a wide geographical area to hold conferences whenever they choose.



Conferees communicate with each other through the computer, which keeps track of the messages, sorts and passes them on to the other participants.

Cannings (19) reports on the experience of a west coast manufacturer who experimented with computer conferencing because of communication and coordination problems encountered in market research projects. A single project required involvement of company and staff consultants located in different parts of the country, but the use of customer information available in only one location. The firm leased computer conferencing services, called NOTEPAD, in 1979. After setting up a research project team, NOTEPAD was provided with the list of team members and access to project information was restricted to members only. When members accessed the system they were brought up to date on any information or messages added since they last looked at the project file. Users also could request specific documents or messages based on the file name, date, entry number or key words. Any new team member could be brought up to date quickly. Members also entered new information which could be available to all other team members or to only one person.

This firm's experience with NOTEPAD and computer conferencing was positive. The number of phone calls and attempted phone calls during the project were greatly reduced. Problems were brought to the attention of all team members rapidly. Members who were traveling or on other

assignments were able to keep in touch with the progress of the project. An historical record of all decisions and actions taken by the project team was provided by NOTEPAD.

In the rehabilitation community, about forty organizations representing disabled persons, research engineers and consumer advocates have been involved since 1977 in a computer conference entitled, Devices for the Disabled. It is devoted to the exchange of information and discussions regarding developments in technology applicable to physically disabled persons. Devices for the Disabled is only one of several conferences operating on the Electronic Information Exchange System (EIES) available from the New Jersey Institute of Technology and established by grants from the National Science Foundation.

All communications during the Devices for the Disabled conference remain on file and can be obtained for review, either selectively (by date, key word or originator) or in total. The conference has been used by members at two distant universities to co-author a journal article. It also has been used to organize and disseminate an agenda for a national meeting. On a more informal basis, the conference has been used to pose philosophical questions, relate unique experiences, share frustrations and encourage brainstorming.

A study by Starr Hiltz (1979) reviewed the use of the EIES by four research groups, including the conference on Devices for the Disabled. Her conclusion was that computer conferencing was a viable means of communication within a scientific community, but several barriers to utilization of the EIES existed. Some conference members did not have easy access to a computer terminal or they had difficulty accessing telephone lines. Users also required training in the use of the system (about five hours) before they felt comfortable using it. However, the users felt the greatest inhibitor to system utilization was lack of motivation. Implementation of a computer conference system must be planned and related to an important need of the conferees.

Vocational Rehabilitation Applications

One of the major advantages of electronic mail is that the sender and receiver do not need to interact simultaneously. As most telephone calls are usually one-sided conversations, it often is more efficient to send a message electronically and to have the receiver respond when it is convenient.

Another advantage is that messages can be sent to several different places at the same time. This can be important in sharing job placement leads, communicating policy and procedure changes, or when complex documents or reports need to be reviewed by staff in different parts of a state.

The real potential for computer conferencing to assist in VR service delivery may be the management of a specific case by a team of specialists located in different parts of the state or region. An entire case file could be kept on a computer or a separate consultation case file could be established. This would allow central and/or field office specialists to comment on specific cases.

Medical consultation is a traditional case management procedure which could be improved through computer conferencing. Physicians could be retained for consultation without regard to their geographic location, thus obtaining the services of the most appropriate physician in the state for each medical specialty. For example, a neurologist could be consulted in every case involving brain dysfunction.

In rehabilitation more specialists probably will be involved in individual cases. Technical support is required in placement, similar benefits, independent living and job engineering. A computer file could be the best means for coordinating and recording the management of a

specific case by the counselor and specialists. This also could be the best method for monitoring and reviewing all the consultation provided over a period of time by a specialist.

Computerized Data Banks

The costs of computer hardware have decreased in the last fifteen years while computer storage capacity and processing speed have increased steadily. Predictions from the computer industry are that in the future new technology will increase dramatically computer storage capacity further reducing costs. This ability of computers to store vast amounts of information and to retrieve selected pieces of information have led to the development of large banks of data. (A data bank is a computerized collection of information assembled in one place.)

A computerized data bank offers a number of advantages:

1. Although data can be accessed from a large number of points, it is stored centrally.

2. Information can be updated readily in one place without having to send out corrections or change notices to all users or potential users.

3. Information retrieval is rapid and accurate.

4. Management information is provided regarding the number and types of requests.

Various computerized data banks having implications for Vocational Rehabilitation will be examined.

The Michigan Department of Education keeps a computer file of personnel who have expertise in specific educational areas. This data bank serves as a resource file of speakers, in-service trainers and project consultants. Resource people are selected by entering a key word, such as "gifted,' "handicapped," 'testing" or a combination of several key words. The data bank indicates how to contact each resource person and tells where and when they last made a presentation on the topic.

A number of states, counties, and cities have developed computerized data banks of services to meet very specific needs which are available to citizens. Several data banks, such as Georgia's TIE-IN, include all available public services while others are designed for specialized groups, such as aged or developmentally disabled persons.

The Montana University Affiliated Program (MUAP) maintains a statewide data bank designed to assist in expanding and improving service programs for developmentally disabled persons (Walkenbach and Crow, 1980). MUAP has six objectives for the data bank:

1. Accumulation of a structured data base which profiles the total program for developmentally disabled persons in Montana.

2. Provision of an efficient search service.

3. Common interest cross-referencing.

4. Improvement of response to inquiries.

5. Dissemination of available research findings.

6. Directory compilation.

The U. S. Department of Labor used computer data bank capacities to develop its nationwide Job Service Matching System. Information on applicants (work history, characteristics, type of job desired) and information from employers on job openings (skill, experience, special qualifications required) are entered into the system. The data bank then can be searched on behalf of an applicant or employer. The system also provides information on the number of applicants, employers, matches and searches during a given period of time. The Department of Labor feels the system's advantages are a comprehensive matching capacity, reduction in needed storage space, faster turnaround time, reduction in work effort and the identification for job seekers of promising labor market areas (U.S. Department of Labor, undated).

The Independent Living Research Utilization Project (ILRU) at The Institute for Rehabilitation and Research, was established in 1977. ILRU offers a Computerized Registry of Independent Liv-

ing Programs containing profiles of independent living programs and organizations that offer independent living services for severely disabled persons. The profiles describe the type of program, disability group served, number of persons served per year, neighborhood setting, service delivery style, vocational emphasis and the specific services provided. The Registry is designed to be a resource for all organizations that serve disabled persons.

The Veterans Administration has three innovative computer data bank applications. The Target System is comprised of five separate data bases with approximately 53 million records.

A discussion of this system is included in Distributed Data Processing (p. 42).

Veterans Administration pharmacies filled over 33 million prescriptions in 1979, as compared to 10 million in 1970. To process this large increase, the Automated Prescription Processing, Labeling, Editing and Storage (APPLES) system was developed. APPLES is an on-line prescription processing system which provides mail and prescription labels, turnaround documents for refills and renewals, medication profiles, drug utilization reviews and management reports. It also provides automatic screening of patients' drug regimens for duplications, overlaps, interactions and allergies. The system utilizes a data bank consisting of over 123,000 patient records, 351,000 prescription records and a drug file with over 9,700 entries.

The Veterans Administration Medical Center in Salt Lake City operates the Mental Health Treatment Service Computer System within the Center's Psychiatric Assessment Unit. System capabilities include: psychological testing, clinical history, physical examination, demographic information, ward assignment, outpatient programs, mental status reports, daily updating of clinical progress notes for wards or clinics, as well as an automated discharge summary allowing "free text" input (see Example 19).

A key feature of the system is the capability of administering, scoring, profiling and interpreting a wide range of psychological tests and clinical interviews.

> With the present software it is possible to receive a scored and interpreted psychological test within one to five minutes from the time the veteran completes the test. The turn around time depends on the length of the test but never exceeds ten minutes. This rapid turn around time results in a significant savings in time and money for the VA and provides much better service for veterans (Veterans Administration, 1980, p. 5).

At the present time 64 psychological tests and 18 clinical interviews can be administered by computer (See Example 20 for a sample printout).

Vocational Rehabilitation Applications

Computer data banks have uses ranging from the location of appropriate devices for the handicapped to the administration, scoring and interpretation of psychological tests. A file of resource people to deal with very specific problems could be developed for a state or region. A data bank could increase the comprehensiveness of a search for similar benefit services. Lists of vendors (schools, workshops, physicians) now kept in file drawers, on microfiche, or notepads, could be kept in a computer bank.

Computer Based Education

Computer based education is separated into two components: computer assisted instruction and computer managed instruction.

Computer Assisted Instruction (CAI) is a modified form of programmed instruction in which the instruction is administered by a computer. In a CAI session, the computer is in effect the student's teacher. Emphasis is placed on instructional methods and student characteristics. The computer can change content and mode of instruction, arrange various mergers of materials, methods, and student input in rapid sequences.

Computer assisted instruction offers the following interaction modes for training: (1) *drill*, in which the student responds in a quick fashion to brief items or questions under a "flash card" format, (2) *practice*, in which the student answers complex questions which could require some off-

ISI 41-7281 SAMPLE,TWO A. M AGE 29 05/20/80 04/10/00

--- STRONG-CAMPBELL INTEREST INVENTORY ---

--- GENERAL OCCUPATIONAL THEMES ---

	THEME	STD	RESULT
R	REALISTIC	43	LOW
I	INVESTIGATIVE	46	MODERATELY LOW
A	ARTISTIC	42	AVERAGE
S	SOCIAL	49	AVERAGE
E	ENTERPRISING	52	AVERAGE
C	CONVENTIONAL	52	AVERAGE

--- BASIC INTEREST SCALES ---

		STD	V LOW	LOW	AVERAGE	HIGH	V HIGH
R	AGRICULTURE	39		X			
R	NATURE	35	X				
R	ADVENTURE	63				X	
R	MILITARY ACTIV.	45			X		
R	MECHANICAL ACT.	40		X			
I	SCIENCE	39		X			
I	MATHEMATICS	51			X		
I	MEDICAL SCIENCE	49			X		
I	MEDICAL SERVICE	38		X			
A	MUSIC/DRAMATICS	52			X		
A	ART	38		X			
A	WRITING	45			X		
S	TEACHING	38		X			
S	SOCIAL SERVICE	59				X	
S	ATHLETICS	55			X		
S	DOMESTIC ARTS	34	X				
S	RELIGIOUS ACT.	39		X			
E	PUBLIC SPEAKING	63				X	
E	LAW/POLITICS	56			X		
E	MERCHANDISING	53			X		
E	SALES	52			X		
E	BUSINESS MGT.	54			X		
C	OFFICE PRACT.	47			X		

Sample Printout
Strong-Campbell Interest Inventory

SLC VA MEDICAL CENTER - MENTAL HEALTH TREATMENT SERVICE
DISCHARGE SUMMARY - 05/15/80

NAME: YOKUM,HOKUM SSN: 999-11-007 MALE CAUCASIAN
BIRTHDATE: MAR 18, 1951 AGE: 29 MARITAL STATUS: SINGLE
SC-STATUS: MEDICAL SC-%: 50 SC-FOR: GUNSHOT WOUNDS

DATE OF ADMISSION: 01/23/80 ADMITTED TO: INPATIENT PSYCHIATRY (TEAM C)
NUMBER OF PREVIOUS ADMISSIONS TO THIS VA MEDICAL CENTER: 1

INITIAL DIAGNOSIS, AXIS 1: 295.11, SCHIZOPHRENIA, DISORGANIZED, SUBCHRONIC, PROVISIONAL, JT, 01/23/80

DATE OF DISCHARGE: 04/30/80 DISCHARGED FROM: INPATIENT PSYCHIATRY (TEAM C)
TREATMENT DAYS: 97 ABSENCE DAYS: 0

DISCHARGE DIAGNOSIS, AXIS 1: 295.95, SCHIZOPHRENIA, UNDIFFERENTIATED, IN REMISSION, IMS, 05/15/80

TREATMENT RECEIVED: SYSTEMATIC DESENSITIZATION, GROUP THERAPY, CONJOINT THERAPY, INDIVIDUAL COUNSELING

RESPONSE TO TREATMENT: (SEE PROBLEM LIST DATED: 05/15/80):

FEAR OF DISASTERS RESOLVLED BY SYSTEMATIC DESENSITIZATION. SUBSTANCE ABUSE OF ASPIRIN INACTIVE AT TIME OF DISCHARGE. THE THOUGHT DISORDER AND VISUAL HALLUCINATIONS UNDER CONTROL WITH TRILAFON. THE CHILD REARING DISAGREEMENTS WERE RESOLVED IN FAMILY THERAPY. AFTER COUNSELING THE FAMILY MOVED TO A DIFFERENT RESIDENCE WHICH RESOLVED THE ENVIRONMENTAL PROBLEM.

MEDICATIONS: TRILAFON, 4 MG. T.I.D., INCREASED TO 12 MG. T.I.D., THEN REDUCED TO 8 MG. B.I.D.

RESPONSE TO MEDICATIONS: INITIALLY THERE WERE LITTLE NOTICEABLE EFFECTS OF THE TRILAFON UNTIL DOSAGE WAS INCREASED. AT 12 MG. T.I.D., THERE WERE NO FURTHER INDICATIONS OF HALLUCINATIONS, HOWEVER, THERE WAS NOTICEABLE MOTOR RESTLESSNESS. STABALIZATION WITHOUT NOTICEABLE SIDE EFFECTS WS ACHIEVED BY REDUCTION OF DOSAGE TO 8 MG. B.I.D.

SUMMARY: THIS IS THE SECOND HOSPITALIZATION IN THE PAST YEAR FOR THIS VETERAN. BOTH TIMES HE ARRIVED IN A VERY DISORGANIZED AND INCOHERENT STATE. PSYCHOLOGICAL TESTING INDICATED A THOUGHT DISORDER AND HE ADMITTED TO BEING FRIGHTENED AT "SEEING" EVENTS WHICH "MUST BE IN THE FUTURE." MR. YOKUM'S WIFE DESCRIBED FAMILY DISCORD PRIMARILY CENTERED AROUND FIGHTS OVER WHAT SHOULD BE DONE WITH THE CHILDREN. TRILAFON WAS PRESCRIBED FOR MR. YOKUM AND HE RECEIVED SYSTEMATIC DESENSITIZATION, GROUP THERAPY, CONJOINT THERAPY AND INDIVIDUAL COUNSELING. MR. YOKUM'S FEARS, FAMILY AND ENVIRONMENTAL PROBLEMS WERE RESOLVED. THE SCHIZOPHRENIA IS IN REMISSION AT TIME OF DISCHARGE.

AFTER CARE PLAN: TRILAFON CONTINUED AT 8 MG. B.I.D. THIRTY DAY SUPPLY GIVEN AT DISCHARGE. MR. YOKUM WAS REFERRED TO THE DAY TREATMENT CENTER FOR MEDICATION FOLLOW-UP AND PERIODIC SUPPORTIVE THERAPY.

DISCHARGE SUMMARY BY: I. M. SHARP, M.D.

Sample Printout
Discharge Summary

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line computation or the completion of multiple steps in problem solution, (3) *tutorial programs*, which resemble programmed instructional texts, i.e., paragraph material, interspersed questions, and conditional response branching, (4) *simulations*, in which the student is required to understand and respond to simplified versions of reality, and (5) *problem solving programs*, in which complex problems are broken down to simpler elements to foster the student's understanding of principles and rules (Huntington, 1979, and Control Data, 1977).

Computer assisted instruction is individualized and, therefore, requires a lot of record keeping. Computers can assist in this area with Computer Managed Instruction (CMI), which is a total educational approach to support the management functions of the teacher. These management functions include methods of organizing curriculum data and methods for assessing and reporting student progress.

Historically, CMI dealt primarily with testing, scoring, analyzing, diagnosing, reporting and prescribing learning activities. Since it is difficult to differentiate instruction from instructional management, large CMI systems more recently also include computer assisted instruction. This development permits a more comprehensive systems approach to learning by including both instruction and its management (Huntington, 1979).

Although there are several Computer Based Education (CBE) systems in existence, one of the more successful applications is the PLATO system. It was jointly developed by the Computer-Based Education Research Laboratory at the University of Illinois and the Control Data Corporation. PLATO is a total system utilizing both CAI and CMI components for individualized instruction. The extensive record keeping capabilities of the system provide student progress reports and assist in evaluating the effectiveness of the instruction. Because PLATO has the ability to update, flashback, review, explain and animate, virtually any activity can be simulated on the PLATO terminal. PLATO is used in a variety of educational, business and industrial settings to:

1. Prepare men and women for entry level positions in the computer industry.
2. Provide educational and business training to companies.
3. Provide instruction in basic skills and GED preparation to those with special needs, e.g., disabled persons, learning disabled individuals, persons with learning and speech disorders, functionally illiterate adults, disadvantaged youths and adults and incarcerated individuals.
4. Train and certify airline pilots.
5. Train supervisors in industrial settings to solve quality control problems.
6. Train salemen in product usage.
7. Teach troubleshooting strategies within the utilities industry.

Control Data Corporation has a special interest in using computers to provide human services to individuals. In 1978, it developed HOMEWORK, a demonstration project to provide services to its employees who developed long-term disabilities. As part of HOMEWORK, selected employees are provided with computer terminals in their homes which are linked to Control Data's computers in Minneapolis. Some of these terminals have assistive devices or adaptations to meet the employees' needs. The home terminals are used to teach, through PLATO, new vocational skills in computer programming or in the development of PLATO instructional courseware. Upon completion of the program, individuals can be employed to work from home with flexible hours and conditions.

The Veterans Administration provides prevocational and vocational training programs for veterans with service-connected disabilities, using Control Data's Fair Break for the Handicapped and HOMEWORK.

Fair Break for the Handicapped provides remedial training in basic skills and general education to educationally disadvantaged handicapped individuals. The objectives of the program are to raise the level of literacy skills for attainment of the GED Certificate, for participation in subsequent vocational training programs and for employment.

Computer assisted instruction programs are currently in use at more than 45 medical and nursing schools and hospitals. All are tied into an IBM computer at Ohio State University College of Medicine. Medical students sit at a computer terminal, which is programmed to act as a patient, and "examines" the machine. Along with describing symptoms and their reactions to medications, the computer points out which of the prescribed lab tests are dangerous or unnecessary, and evaluates the cost-effectiveness of certain treatments (Reina, 1981).

Vocational Rehabilitation Applications

Computer based education (CBE) has potential for in-service training within rehabilitation. With decreasing budgets for travel, CBE can offer standardized training to remote parts of a state or among regions. In addition, clients can benefit from CBE within rehabilitation centers or offices by learning basic skills, job-seeking skills, the rehabilitation process, or through an assessment of a client's specific skill level, academically or vocationally.

Distributed Data Processing

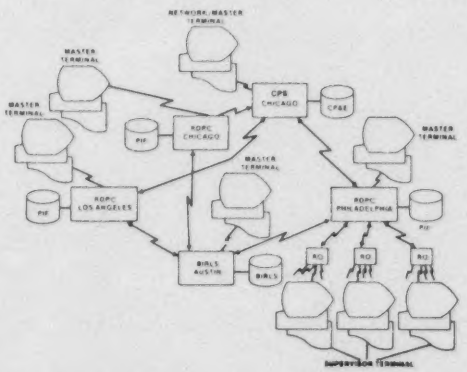
Distributed data processing (DDP) appears to be a response by users to the lower costs of computers and the increased demand for computer utilization and availability. Basically, DDP means dispersing control and responsibility rather than having all computer functions in a central department. A distributed program still requires central control to assure that procedures are compatible and data are unduplicated. Some expected advantages are faster error correction, more accurate data input, reduced load on central computers, faster turnaround time, and increased local control in terms of defining priority computer uses.

There are several types of system structures which can be called distributed. The most common structure is a large central computer linked to several terminals or personal computers in other locations. Detailed records can be kept either in central or remote locations and data summaries or specific records can be obtained from either the central or remote stations. The extent of decentralization of programming would depend on the needs of the remote stations and the technical capabilities of staff.

Another distributed structure consists of cooperating work stations all linked together, with no station superior to any other. In this system, any station can communicate with any other station, making it an ideal structure for integrating data processing and word processing. With such integration, electronic mail and the automation of other office functions are possible.

The third distributed structure is the decentralized, stand-alone system. Each location has its own independently operating data center. The small centers are linked for communications, but it is not done routinely. Only summaries of data would be communicated and usually only for compiling periodic corporate or agency reports.

VA-LINE INTERACTIVE DISTRIBUTED PROCESSING/DATABASE NETWORK



In 1979, the Veterans Administration completed the first phase of Target, a nationwide distributed data processing system to aid in the disbursement of compensation, pension and educational benefits. This phase includes the capability for on-line, immediate access to the Compensation, Pension, and Education data bank of approximately 14 million records, and to the Beneficiary Identification and Records Locator Subsystem of approximately 39 million records. At the heart of the system are four Honeywell large-scale host computers, 100 small computers, 3,000 computer terminals, and 800 printers located throughout the country (Lippin, 1980). The Target system was designed so that veterans could be assisted from any regional office they contacted. For instance, a veteran's file stored in Chicago can be displayed on a computer terminal in Seattle in just a few seconds.

The promise of DDP to assist in VR service delivery includes increased computing power and capability at local levels, faster error correction, more accurate and locally important input,

possibilities for messaging functions and other services to local workers. Examples presented in the next chapter will illustrate these advantages.

Decision Support Systems

While there have been advances in basic information retrieval, processing and display technologies, the application of computer power to management functions has been slow to catch on. In the past, many managers have felt the computer to be of only peripheral value to them as they were overburdened with a hodgepodge of computer reports overflowing with data of little consequence to them.

Within the past decade, new and powerful analytical tools have emerged which have had a significant impact on managerial performance. Decision support systems define a different view of computer applications aimed at providing access to information systems and analytic models directly to managers. Decision support systems serve three primary functions for managers:

1. Support them in planning, problem solving and judgment for tasks that cannot be routinized.

2. Permit ease of access and flexibility of use.

3. Are personal tools, under the individual's control and in most cases tailored to his or her thinking, terminology and activities (Keen, 1980).

These systems make the computer an integral part of the decision-making and planning process and provide a way for managers to get access to and really use information. They support rather than replace the manager's judgment.

A key assumption in decision support systems is that one cannot improve a process one does not understand. The questions that must be answered before the system can be built are: 1) What is the decision or task, 2) How does the manager carry it out, 3) What information is used and in what way, and 4) What would it mean to make the process more effective.

Decision support systems typically consist of three subsystems: the data base, a collection of stored information which can be retrieved and operated upon by the computer system; the model base, software packages representing the planning and decision-making operations; and the decision maker subsystem, the way in which the manager interfaces with the data base and model base to solve a specific problem.

> Decision Support Systems are different from traditional computer-based approaches to problem solving in that they ...rely on the decision maker's insights and judgments at all stages of problem solving - from problem formulation, to choosing the relevant data to work with, to picking the approach to be used in generating solutions, and on to evaluating the solutions presented to the decision maker (Sprague and Watson, 1979).

Decision support systems can be used in operational planning by providing detailed, accurate data that originate within the organization so that managers and executives, in a matter of minutes, can sift through the trade-offs among a number of plans to find the optimum or least costly solutions to operational problems. It also might be used to develop an organization's annual budget. The computer can be programmed to provide, by line item, budget information so that the manager, with a view of the organization's resources and goals, can decide on what the organization can achieve. Decision support systems can be used by anyone who has to make a variety of decisions. The next chapter deals with a decision support system for a rehabilitation counselor in a field office.

Tools for Decision Support Systems

There are four computer tools which can aid decision makers: query systems, computer graphics, analytical routines, and simulation models.

Query or information retrieval systems allow the user to generate his or her own reports and to retrieve information from files quickly, efficiently and on the basis of any reasonable and understandable criteria.

Query systems operate with understandable English commands which make them easy to use by untrained persons. The user can locate information, retrieve it, perform basic computations and have the information either displayed on a terminal or printed as a report.

There are two concepts for a user to understand: commands and connectors. There are about 20 basic commands to get data from the computer. Some of the common ones are: "find", which locates the data; "list" sets forth the data in some order; "report", which prints the data; and "add" or "subtract", which are self evident. Connectors spell out the relationships of the data, such as "equal to", "not equal to", "greater than" and "less than". A specific inquiry to the computer might be: "How many counselors had more than fifty rehabilitations last year?"

Query systems recognize that decision makers very often cannot determine in advance the information that is needed. They must respond to unexpected problems quickly and much of the information needed is exploratory. A good query system allows decision makers to define or redefine the boundaries of the information needed. This can be done without having files of printouts in expectation of a specific request.

Computer graphics refers to the concept of man communicating with a computer by means of graphical symbols such as lines, curves and dots. Through the use of computer graphics, information can be rapidly retrieved, organized and printed by the computer in picture form, complete with legends, titles and footnotes. Thus, the decision making process can be enhanced by presentation of information efficiently and effectively.

Computer graphic devices include CRTs, plotters, recorders, and scanners. The first plotters featured an ink pen that moved back and forth across a rotating drum of paper. It was quite slow and complicated patterns took a long time to produce. Electrostatic plotters use electronics to produce a pattern of dots on paper. They are faster, quieter and can produce more complicated patterns in hard copy. When a permanent, hard copy record is not required, graphics can be produced on a speedy, quiet computer terminal. Graphics produced in this manner may include color and a variety of matrices to view the relationship among several variables (See Appendix D for additional information).

Analytical routines are a type of applications program which direct the computer to perform a particular sequence of tasks. These packages may be purchased, leased or rented depending on the needs of the user. Analytical packages are available or can be developed to include not only internally generated data but also external data. Examples of this are client cost and time-in-status data (internal) and unemployment rates or census data (external). Pre-established routines in the computer allow for projecting trends and forecasting. Two of the more sophisticated analytical packages are the Statistical Analysis System (SAS) and the Statistical Package for the Social Sciences (SPSS). (Additional packages are listed in Chapter 2, p. 29).

The fourth type of decision support system tools is a **simulation model**. Simulation is a technique for conducting experiments on a computer, which involves mathematical and logical models that describe the behavior of a system over a period of time.

Almost everyone has been involved in some type of simulation. For example, an amusement park jungle boat ride that tries to simulate actual conditions, planetarium shows, exhibits in science museums, and driver training in a simulated mechanism with a steering wheel and pedals for gas and brake. Computer simulation serves a manager in the same way that the laboratory experiment helps the scientist. Simulation models provide insights to decision making and selecting appropriate courses of action.

For managerial decision making, the uncertainties, dynamic interactions, and complex interdependencies of a system can be characterized by mathematical formulas stored in the memory of a computer. An analysis facilitates a thorough investigation of both the direct and indirect consequences of variation within a system. Since the model can be run under many different settings, the prime sources of system fluctuations can be identified. Frequently, as a result of computer simulation, management can isolate the principal causes of inefficiencies and bottlenecks, and can improve the system's behavior.

Unlike testing a proposed management system's design or a particular decision in real time with live participants, a computer simulation allows easy replication, permits redesign and retest, records a completely accurate detailed history, and summarizes and analyzes the emergent data rapidly and immediately. Of course, computer simulation can never provide the absolute realism of a field test of an actual system or decision. But since most organizations employ field testing on a very restricted basis, they will find it helpful to use computer simulation analysis to suggest the design of a particular system or selection of alternative decisions before that system or decision is implemented.

Rehabilitation counselors, supervisors and administrators are required to make decisions as a major part of their jobs. The decision making component of VR service delivery has become so complex that the decision maker is oftentimes unable to absorb all the pertinent information and choose optimum solutions. As a result, many vocational rehabilitation personnel will find it necessary to rely on sophisticated computer techniques to assist in the decision-making process.

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Chapter 4

Counselor And Client Information Systems

In the field of computer technology, it is difficult to write about the future - the future is no further off than tomorrow. This chapter does not speculate on future technology, but deals with possible applications and full implementation of today's technology applied to service delivery in vocational rehabilitation.

Use this chapter to shop around for ideas, to ponder social and structural costs and gains, and to unleash your imagination.

The field of view is restricted to a VR unit consisting of 6 to 10 counselors, a supervisor, and support staff. The hardware could be a microcomputer or an on-line terminal to a main frame computer in the central office or time sharing on a minicomputer. The imperative is the immediate access to a computer and the computer files by staff on a real-time basis. Input must be simple, direct and verified prior to storage in the memory.

Counselor Needs

A counselor is the recipient, processor, interpreter, and dispenser of information. The computer is an excellent filing cabinet, a manipulator and organizer of information but it cannot interpret or use the information. A counselor is as effective as the way (s)he uses available management and client-related information, which in turn frequently is determined by the accessibility, timeliness, and accuracy of the information.

To ease caseload management tasks, the computer can remind counselors of activities, perform routine bookkeeping and clerical tasks, keep track of client progress and provide frequently-used information.

Things-To-Be-Done List

A counselor has certain statutory, client and other activities which need attention on a regular basis. It is often difficult to keep track of these activities without elaborate and time-consuming record keeping.

A things-to-be-done list can be retrieved by the counselor each week through a programmed request or through a query system. The following

kinds of information are immediately accessible to the counselor:

- Clients not seen in 30 days or more
- Appointments and home visits
- Statutory reviews - IWRP, ineligible closures, etc.
- Authorizations outstanding for 30 days or more
- Clients on a job for 30, 40, 60 or more days
- Dates for major client activities - surgery, beginning of training, job interviews, etc.

With these reminders, a counselor establishes an effective schedule for the week rather than working on an ad hoc basis. Items are placed on the list at the counselor's discretion, i.e., the events that are important to the counselor. The list must be functional to the counselor because (s)he inputs some of the dates which trigger the reminders. Other dates, however, are established by information from documents and other sources.

Caseload and Client Progress

A large number of caseload and client information reports can be programmed into the computer. For instance, a counselor needing caseload summary statistics selects the appropriate report number, which is entered into the computer along with the date parameters and counselor number. The counselor receives the requested report almost immediately. If a hard copy is needed, it can be printed. No longer is it necessary to print reams of reports routinely and mail them around the state from a central location.

Counselors receive current information as needed and in the most useful format. (Security measures can be built into the system and programs so that access to the information is limited only to the counselor and his or her supervisor.) In addition, counselors requiring specific information can design and request their own special report. Such ad hoc reporting reduces significantly the programmers' workload. The request could be entered as simply as: "List client number, name, major disability when time in current status = 3 months or more."

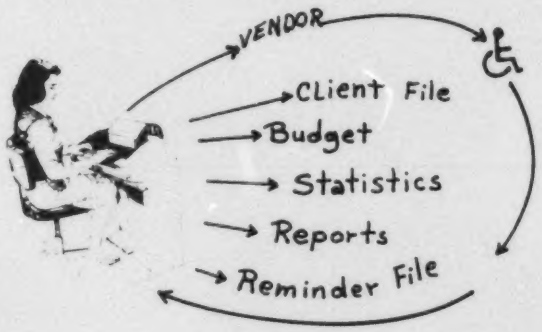
The availability of a statistical package enables the counselors to transform the data in their caseloads into statistical studies or graphs of varying levels of sophistication. The statistics enable the counselor to do such things as determine trends, document caseload activities, and compute correlations between outcome and time in status. From these, adjustments can be made for caseload management.

The critical factors are that the counselor have easy and rapid access to caseload information, that it be current, easily manipulated, and provide the counselor with what (s)he needs to know for efficient and effective functioning.

Counselors, on their part, must learn the significance of the information and the effects of caseload management on the individual client's rehabilitation program and the entire caseload.

Fiscal and Accounting Procedures

Many counselors are issued a budget at the beginning of the year and are expected to meet their goals within the constraints of that budget. Systems exist today where a counselor receives reports that show the amount of funds expended within various time frames, the amount encumbered, and the amount remaining in the budget. One possible system works like this:



1. A counselor determines a certain purchase is required for a client.

2. (S)he goes to the computer's vendor file to determine vendors previously used for this item and the cost.

3. The counselor or the secretary calls up

the authorization form on the screen. Then the following information is entered onto the form: Vendor Number (secured from vendor file), Client Number, Item Name, Code Number, Authorized Cost and Counselor Number

4. The computer verifies the information as it is entered: If there are established fees for the item and the authorized cost exceeds the fee schedule, the computer notifies the operator and stops accepting information. Similarly, if some other item does not meet established criteria, the process stops until corrected or overridden. If the counselor's budget does not have sufficient unencumbered funds, the process also terminates. Items that are inconsistent with the built-in edits or with budget restrictions are noted on the screen.

5. Once all items pass edit criteria or are otherwise overridden, an authorization and invoice are completed and printed by the computer. The addresses of the vendor and client already are in the data bank. The printed authorization is ready for signature and mailing, with the counselor receiving a copy for the client's file.

6. The computer prepares a statement of the remaining unencumbered balanace in the counselor's account.

7. The client and vendor files are updated. If the authorized purchase was from a new vendor, the appropriate information is entered into the vendor file.

8. The authorization information is placed in a pending file. If a starting date for training or a medical procedure is included, this is also suspensed for the counselor, to trigger a reminder at a later date.

9. When the vendor provides the service to the client and returns the invoice for payment, the counselor or secretary inputs the authorization number into the computer. The invoice is displayed on the screen, and the necessary information then is entered and verified by the computer.

10. The computer performs the following:

    a. Availability of funds is verified.

    b. The encumbrance is cancelled and removed from the client and counselor data files.

    c. Services provided are entered into the client data files.

    d. Depending upon Comptroller requirements, the computer takes the actions required and prints a check for payment.

    e. Documentation is provided for client files.

    f. A new balance of funds is provided for the appropriate budget categories.

The importance of such a system is that the counselor knows how much money is available for client services at all times. Many such systems exist today, but few are current on a daily basis. If the information from the authorization document is checked against the budget by the computer as it is prepared, there can be instant verification that the counselor has adequate funds to honor the authorization.

Projections from current obligations could alert the counselor to possible budget shortages if spending continues at the current level. Using the expenditure and encumbrance information as a base, the counselor could enter a proposed rehabilitation plan into the computer, be notified what those projected costs would do to his or her budget within the established time frames, and learn the probability of the plan being totally funded and implemented. The counselor then could adjust the services and the plan accordingly.

Vendor Lists

Time can be saved by counselors and a wider range of services be made available to clients

through the use of computerized vendor files tailored to the needs of the local office. The file can be local or statewide in scope, and organized by vendor name, product or service, including professional service. The following is a sample of an alphabetical vendor file:

Vendor Name Address	Vendor #	Service	Fee Schedule	Date Last Purchase
Forge Clothes 3962 Main Street Jonestown 42843	962039201	Men's Clothing Women's Clothing		10/81
Forth Appliance 692 South Street Homer, 42973	639210664	Prosthetics Orthotics	* *	6/81 6/81
Glenn Modifications 483102 South President Smith, 42961	461889462	Van Modifications	*	4/80
Great Drugs 22 Peach Street Venice	694021691	Drugs Medical Supplies	4/81	2/81

The asterisk (*) indicates the existence of a fee schedule or contract which needs to be called up if that vendor is selected.

It is possible to list the vendors by the services they provide, permitting the counselor easily to select a vendor that is most convenient for the client. It also facilitates mailing of bid requests and making inquiries. The user also can add counselor comments, criticisms or other desired information.

A vendor file requires maintenance by the staff. The information in the file is only as good as that entered by the staff. The name, address and number of the vendor can be input through a vouchering system, but updates of services available and provided, address changes and comments require staff participation.

Client Related Information For Counselors

Decisions concerning clients should be based on as much relevant information as possible. Computers and other technologies can aid with the collection, storage, retrieval, and security of the necessary information with a minimum of time, paper work, and filing. The following are some of the ways client information can be enhanced.

Referral and Application

When a referral is received on an individual, a staff person enters the person's name, address, social security number, and other required and available information into the statewide data bank. The computer then searches current open and previously closed client files to determine if the individual is or has been a client of the agency. A similar search can be made of cooperating agencies' files to discover if the individual is active with another agency.

The computer's message might read:

Unit 691, Counselor 401
Doe, Jane, 691320614 - 462 Easter Road, Gatham
Current Status - 99 - Previous - Sept. 1968 -July 1969 - 26
Disability - 630 - File Location - Unit 321
Other Current Agencies - AFDC - Unit 921, Worker 421, Medicaid - Unit 922, Worker 601.

Concurrent with this message, the computer requests Unit 321 to send the closed file to Unit 691, Counselor 401. Jane Doe's name is added to the counselor's caseload, and as a referral to the unit and statewide statistics.

When the client comes to the office for the initial interview, (s)he views a video disk or tape which fully explains the vocational rehabilitation program. Then the client completes an application form on the computer screen by directly entering the information into the computer. The application form becomes the input document for the data files. If the counselor prefers, the information can be entered by support staff or by a scanner directly into the previously established client file.

All this information is available to the counselor for review prior to the initial interview.

Diagnosis and Evaluation

All paper and pencil tests are administered to the client through use of a microcomputer or terminal in the vocational rehabilitation office. Results are returned to the counselor almost immediately for discussion with the client. Full interpretation and correlations with other tests require additional time. Computers cannot be used

in this way for psychological and vocational interest tests requiring administration by and interaction with a psychologist, but can be used for the more common screening tests.

Physicians can dictate medical reports over the telephone. The VR unit has a recorder which accepts dictation at anytime. The recordings are transcribed by the secretary who returns it to the physician for review and signature. In the interim, the counselor has the dictated report for formulating activities or further screenings.

While local medical consultants continue to play an important role, it may be more economical and practical to have statewide one or two specialists as consultants. By using facsimile transmission, medical reports with accompanying test results can be transmitted to a statewide consultant for his or her opinion and recommendations. (Since facsimile transmission is used for transmitting all records, reports and other documents, units have the equipment available.)

Computer conferencing is another technique which expands the number of specialists (medical or non-medical) contributing to the evaluation or development of a rehabilitation plan. A difficult case is placed in the computer case file and experts from around the state review the file and provide input.

Decision Making

One of the most critical decisions a counselor makes is on the client's eligibility. Computers cannot make decisions for counselors but properly programmed, they can assist the counselor in making better judgments.

When information on a client is entered into the computer, the applicant's characteristics can be compared to previous clients with similar characteristics and their rehabilitation outcomes tabulated. A probability of successful closure, based upon the previous experience of clients with similar characteristics, is computed. The data base for this file can be local, regional, or statewide.

The following describes a portion of a continuing research project at the West Virginia Research and Training Center:

> In these days of diminishing resources for social programs, it is imperative that the VR counselor perform eligibility determination tasks in an optimum manner. That is, the counselor must process the application of a potential client as quickly as is practical since extended delays at this level will undoubtedly cost the agency in terms of both personnel and fiscal resources. Furthermore, the counselor needs to accurately assess the probability of successful outcomes for a particular applicant to determine those individuals who have no vocational potential (low probability of successful closure). Such cases who are accepted into the VR system will most likely have little or no positive outcomes from the services provided, yet they may be as expensive to serve as the successful cases. This sub-system, then, is designed to provide the counselor with information which will serve as an aid in deciding the eligibility or ineligibility of an applicant to the VR program. To a large extent, the information provided by this sub-system will be based upon actuarial models of the probability of successful closure given various salient characteristics of the pending client. (p. 283)

Other Aids

Simulations of rehabilitation plan development can be useful to counselors and clients. The simulations show the effects of changing various areas of the plan - time, cost, service, outcome. The counselor is presented alternatives, reminded of necessary prerequisites, and provided with projected costs. With the available alternative routes analyzed, more realistic decisions and plans are possible for the counselor and client.

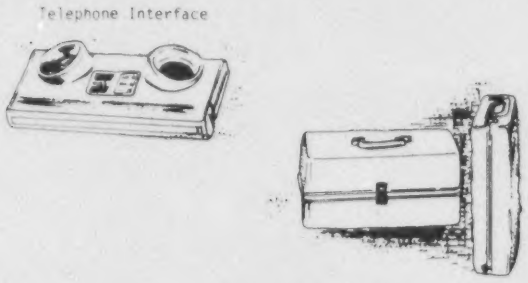
A software package provides counselors and clients with specific information on job opportunities. In the VOCOMP* system, a counselor completes a fact sheet on the client, including work history, occupational preferences, func-

*VOCOMP, Innovative Software, Woodland Hills, California

tional limitations and test results. Within days, or hours if on-line, a report is received detailing specific job possibilities, starting salaries, availability of each job in the client's local area, the training required, and local training opportunities.

Additional assistance is available to counselors from the growing number of local and national information banks that catalog such things as services, adaptive devices, rehabilitation engineering techniques, research materials, local employers, locally available similar benefits, and educational institutions.

Wherever a telephone is available, counselors have access to the information stored in the computer. Carrying components of a remote terminal in two cases and with a telephone interface, a counselor provides a homebound client with all the information, including occupational information. available in the office.



One case holds video monitor, the other holds keyboard, power supply, cassette, cables and tapes

Or the components can be used by an itinerant counselor at a remote site for full access to the computer.

Technology For Clients

There are a variety of ways clients can use computers in their rehabilitation programs, starting with filling out their application form on the terminal.

Many clients, who have not worked previously or who cannot return to their former occupations, have limited knowledge of the range of vocational opportunities. Clients can work directly with the computer, adapted with a voice synthesizer if needed, to learn about occupations - physical requirements, necessary training or education, salaries and tasks. After selecting one or more possible occupations, the client and counselor then discuss the potentials and alternatives. Supplementing this process are data files listing the schools that offer the training, and existing job vacancies from the local employment service.

Several training systems exist that teach in a systematic and orderly method all levels of basic educational and vocational skills. Vocational rehabilitation clients requiring an upgrading of reading, arithmetic or other skills can come to the local VR office and use the computer to learn these skills.

Computer time also can be made available to client self-help groups to store and retrieve information useful to their groups' endeavors.

Job opportunities for computer programmers and for other computer operators probably will continue to expand. Television classes, computers and telecommunications can bring the required instruction directly to the home or to a local office, even in a remote part of a state, thus benefitting all clients but especially the homebound.

Technology For Supervisors

Rehabilitation unit supervisors are business managers, teachers, casework experts, arbitrators, public relations experts, supervisors, and human relations specialists. Of all their functions, unit supervisors are probably least prepared to face the problems and demands of business management. For the most part, supervisors were formerly counselors with a counseling or other liberal arts background. But

budgetary control of client service monies is essential if clients are to receive prompt and appropriate services throughout the year.

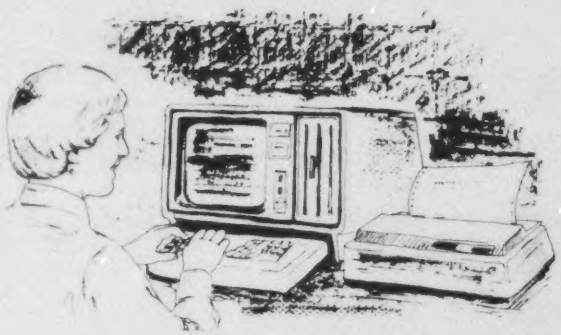
Properly programmed, the computer presents the supervisor with daily updates of expenditures, encumbrances, and remaining balances. The report formats and information items are those that are most meaningful for the supervisor and the situation. Computer graphics present the information clearly and can be used to project trends. A supervisor could overlay current year expenditures over the previous year's to decide if modifications need to be made in spending patterns.

Because all the unit's fiscal information is in computer memory, simulations can be used to provide the supervisor with information to make decisions. For example, if expenditures and encumbrances are exceeding the prior year's, the supervisor could ask the computer what effect implementing an order of selection or reducing referrals or cutting back on maintenance would have on the remaining funds. These options need not be tested at the expense of clients or staff.

Before implementing new fee schedules, accurate projections of the number of clients that could be served, the effect on the budget, and the number of services that could be purchased are possible. In other words, blind assumptions and guess work can be eliminated from budgetary decisions.

Counselor spending habits are easily monitored. If desired, the supervisor secures not only the amounts spent by a counselor, but the types of services purchased, amounts spent on types of services (i.e., the average weekly maintenance provided by counselor 691), and the vendors used. Does the counselor use only one or two physicians although others are available? Are a variety of training programs utilized by the counselor or only two or three? This information is available only to the counselor and the supervisor since security and limited access codes are built into all programs.

Instead of reams of computer printouts to answer every possible question, the computer has pre-programmed reports that can be called up as the supervisor requires. Prior to conferring with a counselor, the supervisor, for instance calls up reports 10, 19, and 23 for counselor 112, which would provide in various formats the aspects of casework to be discussed.



Supervisors no longer have to wait days or weeks to secure answers to questions asked by consumer groups, referral sources, and vendors. The computers have local information available either in the unit's microcomputer or from the agency's main frame. Inquiries can be responded to with accurate information accompanied by tables or graphs prepared and printed by the computer. Community facts can also be stored in the memory banks providing such information as population breakdowns, incidence and prevalence rates, population and employment trends - all tied in with vocational rehabilitation statistics, if needed.

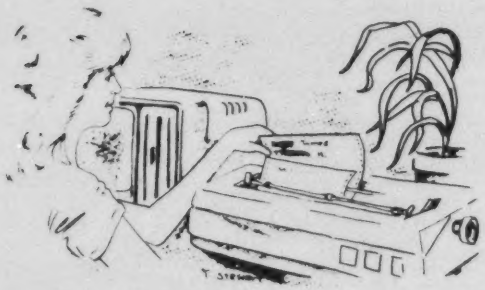
Supervisors can be in closer contact with the state office with more rapid exchange of information via electronic mail, computer conferencing, transmission of information from one computer to another, and satellite television conferences.

With more information in understandable and useable formats, supervisors have better control of their jobs. They can be more responsive to counselor needs and have a greater appreciation of the interrelationships between counselors, clients, supervisors, the agency and the community.

Technology For Support Services

A great many support services are required to

deliver services to clients: letters must be written, accounts kept, case files maintained, invoices prepared, and manuals written and updated.



A word processor with a high quality printer prepares a large portion of the routine correspondence. For instance, a standardized letter for a medical appointment is called up on the screen. Staff enters the client's number as well as any special instructions. If the client's and vendor's numbers are entered, the word processor searches the files for the complete names and addresses, then proceeds to prepare an original letter, with copies for the physician and counselor. If the client's and physician's names and addresses are entered, the processor only needs to type the letter and prepare mailing labels.

Manuals, directives, fee schedules and the like are maintained on the word processor rather than by each counselor. These materials are indexed for easy retrieval of desired items. Changes are easily accomplished, making the system par ticularly useful for rapidly changing information such as fee schedules. Word processors that can communicate with each other permit the sending and receiving of text. Thus, important directives, manual changes or other materials can be transmitted from the state office to the field in a very short time. Facsimile transmission also can be used, especially for graphs, charts, and pictures. As both systems use telephone lines for transmission, long distance phone charges could be quite expensive.

Training for counselors, supervisors, and other staff can be conducted through packaged training programs on the computer at each individual's pace. When the computer is equipped with a voice synthesizer, new counselors utilize simulated client interviews to experience a life-like situa tion before conferring with a client.

Counselors use microrecorders to record all casework. These microtapes need not be transcribed as they are corrected as recorded, and indexed at entry. Finding information on a tape is as easy as finding an entry in typed case records. Instructions to secretaries can be read into the recorder while in or out of the office.

Role Changes

Integration of technology into the service delivery system changes the staff's roles, methods, techniques, interdependence, and structure.

Counselor's Role Changes

The computer makes vast amounts of information available within minutes, enabling counselors to spend less time seeking available services, training, and jobs. Choices for clients increase as the information base expands. Intuitive decisions no longer need to be made; decisions are based on testing, knowledge, and models. The little book with lists of services, friendly vendors and cooperative employers is gone; a VR counselor calls up information from the computer on the car telephone. And the inexperienced counselor has access to the same information as the experienced counselor. Counselors spend more time with clients and in direct service provision. With direct input of information to the computer, most forms are eliminated along with a lot of other paper work. Statistics and reports are generated by the computer.

Counselors must learn how to use this increase in quantity and quality of information. The counselor and the client cannot surrender their judgment to the computer's projections or statistical pronouncements. The counselor needs skills to facilitate a client's understanding of the available information, to develop effective rehabilitation plans based on the information, and to assist the client reach the rehabilitation goals. Guidance and counseling probably will become the primary function of a counselor.

There are costs, however. The data bank must be "fed" the information it stores, sorts, and feeds back. Although much information is available from routine information gathering sources, the counselor is responsible for items such as new employment opportunities, vendors, appointment dates. With access to a microcomputer or a terminal, direct input is possible, instead of filling out a form. Either the counselor or a member of the support staff can do this.

Counselors need some computer operations training, at least at the inquiry level, and the computers can do the training. A counselor with limited programming skills can manipulate the information stored in the computer to yield even more useful information.

Images and roles are often given up reluctantly. But some people welcome the release from restricted services and perspectives, and the need to spend hours researching services and costs. Others welcome the extra hours to spend with clients or to serve more clients.

Supervisory Role Changes

A supervisor's role does not change as much as the other staff members. However, (s)he plans and manages in a more deliberate manner. Crisis intervention can be replaced by control and planning, but more training in management is needed. The staff still requires guidance and supervision to reach their full potential.

Public relations work will become essential as the supervisor is able to call upon more information, especially about the community. Outreach will become a major function of the supervisor.

Supervisors continue to have tough decisions and tasks placed before them and they need to call upon technology to make better and more timely decisions.

Support Staff Role Changes

The roles and functions of support staff could undergo the greatest changes when there is a full utilization of technology. Routine letters handled by the word processor, authorizations and invoices prepared by the computer, and all bookkeeping done automatically. With information input directly into the computer, fewer forms need to be completed and filed. If counseling notes are retained on microtapes, they need not be typed. Many of the clerical tasks are eliminated and, consequently clerical jobs. This does not mean, however, fewer people required at the subprofessional level, but rather different, more interesting positions. The traditional support positions are upgraded. A word processor operator and perhaps a secretary are required and these jobs present greater variety and require new skills. The unit could have one person responsible for operating the computer and/or terminal, requiring the designing of simple programs or extracting information with a query system. Other staff could be responsible for updating or securing new information for the data banks or for maintaining the community information. Still other sub-professional staff could function as rehabilitation technicians helping clients to complete applications, use the computer for testing, vocational information or guidance.

Social Changes

Messages and satellite-linked conferences increase contacts between the state office and the various units. But as units become more self-sufficient and fewer state or regional meetings are held, isolation increases. Telecommunications with the computer reduce the need for counselors to go to the office as frequently. Instead, telephone hookups with the computer are used for securing and reporting information.

An organization traditionally serves as a major social contact for people, giving a sense of belonging to a unified whole. Technology could weaken this structure by permitting looser ties to the larger organization - a cost with profound implications. A substitute for this loss of sense of identification needs to be addressed.

There are human and social costs to be considered when developing or selecting an information system. Any organization changes upon the introduction and full utilization of technology. Jobs are modified or eliminated, and the frequency and content of interaction between staff changes. These costs must be weighed against the benefits.

The technology exists today to accomplish everything described in this chapter. Whether such potential is implemented depends on the decision as to what is best for each state agency, its staff and, most of all, its consumers.

References

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Chapter 5

Hardware, Software and Personnel

Most vocational rehabilitation personnel have little or no technical background in computers. But to survive in today's technological explosion, there are certain basic things one needs to know about the computer: (1) what is the equipment, (2) how does the equipment operate, and (3) who runs it.

At present, most VR staff use a computer by completing and submitting forms, and receiving back stacks of paper printouts. In the future, staff will be in contact with the computer through a keyboard, screen, and printer and they will find the computer increasingly useful as a working tool. The keyboard takes information in alphabetical or numerical characters from a person; the screen displays the information; and the printer provides a copy of the display on paper. These three pieces of equipment will serve as the primary interface between vocational rehabilitation personnel and the computer.

Hardware

Hardware, which is the equipment that makes up a computer system, has undergone significant changes since the first large scale electronic computer was built in 1946. ENIAC (Electronic Numerical Integrator and Calculator) was built for the Ballistics Research Laboratories of the U.S. Army, and it filled an entire room. It required so much power that it sometimes caused the lights in the city of Philadelphia to dim when it was turned on. Only 30 years after ENIAC was created, engineers put the equivalent computer power of ENIAC on a single silicon chip less than 1/20 of a square inch in size. The first commercially built computer costing $1 million can now be duplicated with 18 tiny silicon chips costing about $10 each. Hardware costs have decreased spectacularly and are expected to continue to do so.

Terminals

A terminal allows a person to interact with a computer. It usually has a keyboard (a typewriter-like printing device) and may have another display device called a screen (which is just a modification of your TV set).

Screen - The simplest terminal hardware that a vocational rehabilitation staff person comes in contact with is a configuration typical of a bank cash machine. These stand-alone terminals ask, through words on a screen, for certain information. Once the proper account number has been entered through the keyboard, the computer looks for this account and displays that account's information on the screen. The use of this type of terminal in a vocational rehabilitation office might be limited to listing occupational codes or open client cases.

VR staff also can use a computer terminal screen to gain additional, more complicated information. For instance, certain educational computer programs require the use of only one or two keys, e.g., hitting the "Y" key. With these pro-

grams a staff person or a client could operate a terminal to read information on available vocational rehabilitation services and the rights and responsibilities of clients.

The newest type of terminal, a Touch Screen, does not require a keyboard for interaction with the computer; all information is displayed on the screen. To change the information, a person simply touches certain specific spots on the screen. For example, the computer could ask on a screen, "Do you want to see a list of your overaged cases?" Touch the word "Yes" if you do and "No" if you do not.

Touching the screen is equivalent to hitting keys on the keyboard to input new directions to the computer. For now, however, the most likely interaction with a computer will be through a combined keyboard and screen terminal.

Keyboard - A computer terminal's keyboard looks a lot like an electronic typewriter. Suppose a counselor sits down at a keyboard, what happens when a key is hit (assuming the machine is turned on)? Hitting the key literally connects two wires and causes electricity to flow. When the circuit is closed, an electrical impulse goes from the keyboard to the computer.

At that point the computer does one of three things: (1) it sends an electronic message to the screen to display the letter just hit on the keyboard, (2) it sends the printer a similar message to print the letter, or (3) it tells the storage memory in the computer to remember the letter. But, it also may do all three at the same time. Thus, the keyboard is a simple input device for the computer.

To operate a keyboard one has to find the "off" and "on" switch and learn what each key means. The meaning of each key is determined by the language the computer operates in, discussed in a later section.

Printers - Printers vary in cost, quality, and speed. At the lowest end of quality is the thermal printer with a special silvery paper on which characters are "burnt" electronically. In the middle is the dot matrix printer, where each character printed is a combination of very small dots. At the highest end of quality is the daisy wheel printer with individual characters hit by an electronically controlled hammerwheel.

IBM selectric typewriters can be wired into computers as printers but for constant use the selectrics have not held up under the computer's severe requirements.

Line printers print an entire line at one time and are very fast, e.g., 400 to 3,500 lines per minute. However, the quality of print is not very good. They are used most often for high volume production printing by large computers.

The speed of printers which print a single character at a time, i.e., daisy wheel, matrix, or selectric, varies from 15 to 60 characters per second, the equivalent of 150 to 600 words per minute. The newest printers are laser or fiber optic, which can print an amazing 1,800 characters per second. Such equipment also functions as a copier which could help justify their present high costs.

Dumb and Intelligent Terminals - The simplest terminal takes in information from a keyboard and transmits it to a computer; it sends and receives only. Without any processing capability of its own, it is called "dumb". The oldest dumb terminal is Western Union's Telex where information is entered on the keyboard and sent over a wire or received from the wire by printing on paper.

More recent innovations allow outgoing and incoming information to be displayed on a screen as well as a printer. Nevertheless, this terminal is considered dumb as it cannot calculate or edit.

An intelligent terminal contains a microprocessor, which allows calculations or reordering of information before sending it to the computer. For instance, an intelligent terminal can accept basic information on a client, do several calculations, and then transmit this information. Or it might be used to check entries, e.g., making sure that every social security number has nine digits before sending it to a computer. Although limited calculations are possible, the microprocessor in an intelligent terminal is usually quite small, holding only a few numbers or

characters at one time.

Storage

Most computers and intelligent terminals must have some form of a storage system to be able to handle all the data at one time. In the traditional office, most information is stored on paper in file cabinets; the computer stores information on magnetic tape or plastic disks.

These computer storage systems work like a good secretary in a vocational rehabilitation office (even though we may never find out how the secretary does it) the computer has a procedure for storing the electrical impulses and a separate procedure for finding the electrical impulses when they are needed.

The usual storage medium is a disk system. The smallest disk is the 5" mini-floppy, approximately the size of a 45 RPM record but much thinner and more flexible, hence "floppy". A disk is mounted on a disk drive by inserting the disk into a slot in a box-like apparatus which is connected to the computer by a series of wires. With a disk in the disk drive, information can be typed into the computer and stored on the disk in much the same way that sounds are stored on magnetic tape by tape recorders. Once the information is stored on a disk, the computer can be instructed, i.e., programmed, to pick the information back off the disk for use in the computer.

An intelligent terminal or microcomputer can hold as few as 8,000 characters while a mini-floppy disk has space for approximately 100,000 characters. This is equivalent to 2,000 names and addresses averaging 50 characters. Larger sized disks, holding as many as 50 million characters, primarily are used with large computers.

Memory

In addition to external storage on disks or tape, computers also have internal storage called memory or primary storage, built into the machine. The size of the memory is a crucial variable in the operation of a computer. The larger the memory, the easier the computer computes. In general, the larger the computer, the greater the memory and, not so incidentally, the greater the cost. A small hand-held computer's memory holds only 1,400 characters. The largest computers hold over four million characters in memory.

One of the newer techniques for increasing memory capacity is magnetic bubble memory. The memory is contained on tiny magnetic regions that can be created, destroyed, and moved about in a garnet-like material. Bubble memory provides at least a 10% increase in computer memory capacity and the additional advantage of retaining information even if the external power source is removed. Therefore, bubble memory can provide data security in the event of electrical power losses.

Characters - The term "characters" (in computer language, bytes) means simply the letters, numbers, or spaces used to convey information. For instance, each person's name has a specific set of characters. "John Q. Public" has 14 characters when all the letters, spaces, and the period are counted. If John's address were 2722 Eastlake Seattle, Washington 98102, then name and address would total 54 characters. If a computer holds 48,000 characters, then almost 1,000 names and addresses can be loaded into the computer at one time. Computer people represent 1,000 with K for kilobyte and would say that if a computer holds 48K characters or bytes, then almost 1K names and addresses can be loaded at one time.

This simple example only illustrates the size of a computer memory in relation to the number of characters in a name and address. Later in this chapter there will be a discussion of why some of the space for characters is used for the operating instructions.

Central Processing Units (CPUs)

The key part of a computer is the central processing unit. It controls all of the other internal and external units, such as disks, printers, keyboards, memory, and screen. Control is exercised by sending electronic impulses to the units requesting them to send, store, display, or print data.

The CPU contains the Arithmetic/Logic Unit,

which does the actual calculations. It adds or subtracts as instructed until certain constraints are met. For example, a computer can be instructed to add a series of numbers until eight numbers have been added. Then the sum of these eight numbers is stored or the computer can be instructed where and under what heading to print the number. The computer also can rearrange a set of alphabetical characters and print them.

Since the Arithmetic/Logic Unit does such simple things as add, subtract, and rearrange, it must do them fast-enough to be cheaper than human beings doing the same tasks. Speed is the major difference among the various sizes of computers. On large computers speed is measured in picoseconds, one trillionth of a second.

The size and number of computers available on the market today is mind boggling. The primary generic classifications are:

Microprocessor

Microcomputer

Minicomputer

Main frame

Super computer

Because of the rapid technological development in the computer industry, these categories overlap, but some general characterizations are possible.

Microprocessor - The smallest computer with a very small memory and a limited set of built-in input/output instructions. A microprocessor operates things like a digital watch or small travel alarm clock and is used frequently as the "brains" of an intelligent terminal.

Microcomputer - Has a complete but limited set of built-in input/output instructions and has a memory of up to 48,000 characters. The CPU can handle only a limited number of characters at any one time and its speed into and out of memory is slow. Home computers are usually microcomputers.

Minicomputer - Uses characters in small groups but it has a larger memory (64,000 characters) and the capability to handle up to six terminals. Superminis are being marketed with more memory, higher operating speeds, and the capacity to handle sixty-four terminals.

Main Frame Computer - Comes in small, medium, and large sizes. The small main frames are faster and have larger memories than minicomputers. More importantly, they can share their computing time with a number of terminals concurrently as each terminal's program develops. Medium and large main frames, in addition to having greater speed and size, can do multiple programs at one time and can communicate with other machines in order to maximize the work done by all the CPUs.

Super Computer - Very fast computer with the special capability to break down a problem, like complex multiplication, into many small steps and to do the steps at the same time.

Data Communications

Data communications refers to the electronic transmission of data from one location to another, usually over communication lines such as telephone or telegraph wires. The time required to move data from a location to the computer, and from the computer to the point of use is reduced from days or hours to seconds. This time reduction is significant if you need to have an immediate answer. Of course, the cost of data communication must be weighed against the benefit of speed. But improved technology is increasing the cost/benefits of data communication.

Modems, Data Sets and Acoustical Couplers - Existing telephone lines are the best means for transmitting data from one point to another. Unfortunately, however, computers operate digitally (in pulses) and telephones use analog (waves) transmission. The solution is to convert computer signals from digital to analog, transmit the signal over phone lines, and then convert from analog back to digital for the computer. The device which converts the signals to and from digital is

called a modem, and one must be used at each end of a telephone line. Modems can either be an acoustical coupler or data set. An acoustical coupler is a box-like device with a cradle to hold the receiver of an ordinary telephone. Workers in distant locations simply dial up their home office computer, place the telephone receiver in the acoustical coupler, plug a computer terminal into the acoustical coupler, and communication is established.

A data set is a fixed connection between the telephone line and a piece of computer equipment. For example, terminals may have a data set (modem) built in and therefore not need a separate piece of equipment for communications. The acoustical coupler is less expensive but also less efficient than the data set.

Speed - The speed with which information moves is measured in bits per second (bps) and is often referred to as the baud rate. Bit means a binary digit and it is the smallest unit of information the computer can comprehend. Depending upon the computer, it takes six, seven or eight bits to represent one character. Therefore, if it takes eight bits to represent the character "0" and the baud rate on a telephone line is 4,800 bps, you could send 600 "0s" each second. Typical baud rates are 600, 1,200, 2,400, 4,800, and 9,600 bps although rates of around 48,000 bps are becoming more and more common with large computers.

Time Sharing - It is not unusual to have several terminals in communication with one computer. This results in several users sharing time on the same computer. When the computer pauses in the processing of one person's job, it switches to the processing of another user's job. This happens so rapidly a user is unaware the computer is working simultaneously for other users.

Time sharing often describes a situation in which each user functions independently, with the programs on each terminal unrelated to those on other terminals. Each user only pays for the computer time and storage space actually used. For example, an accounting firm, a rehabilitation facility, a lawyer, and a physician could all be sharing time on the same computer. A user could not obtain another person's data and probably does not know of the other user's existence.

Time sharing offers a lot of advantages, primarily flexibility by having computer power available when needed. The problems of hiring staff, maintaining equipment and housing the data center are eliminated. Costs are dictated by actual use but if your computer use reaches a high level, lease or purchase of equipment should be considered.

Software

Computers must have very specific instructions for everything they do. These instructions must be detailed, sequential, and logical and they must allow for every possible occurrence. Instructions that are used to complete a single job are called a program. All the programs used or available for a computer are called collectively software. Programs must be written in a computer language and a computer may utilize programs written in several different languages.

Software can be illustrated by comparing a computer to a simple door. The hinges, handles, and locks are traditionally called hardware and, accordingly, can be purchased at hardware stores. The sign on the door explaining how to open it is the *software*. The sign can say simply "IN" or "OUT". Or there may not be a sign, assuming everyone knows how to operate the door. At the other extreme, the sign can have complete instructions, i.e., "Insert key and turn it clockwise; turn handle and push". These instructions can be in various languages or symbols, e.g., a drawing of a man or woman. The important thing to remember is that the computer (hardware) cannot do anything without instructions (software) in a language it understands. (Appendix E contains additional discussion of software.)

Languages

Computer languages are not English! Nor are they, for that matter, French, Italian, Russian, Hebrew or any other traditional language. Nonetheless, computer languages are languages. If you learn to write them on a keyboard, the computer will do what you want, provided it understands the language you are writing.

In a typical VR office a counselor asks for a specific file by saying, "May I have the file on

XYZ". The secretary goes to the file drawer, pulls out the file on XYZ, gives it to the counselor (S)he opens the file, reads it, adds information to it, and gives the file back to the secretary who returns the file to its proper place in the file drawer. The language used by the secretary and counselor could be English, French or Russian, but the hardware would be the same - a file, file drawer, a table to lay the file on while in use, and paper, pen and pencil to enter information into the file.

A computer can do the very same thing for a counselor who has the hardware - a keyboard, screen or printer, and some form of storage, usually a disk - and a language both counselor and computer use and understand.

Examples of Language - Higher level languages are more similar to the English language than lower level languages. The following computer languages are discussed in the order of their closeness to regular English.

- QUERY

  The closest computer languge to English is QUERY. With this language, a counselor would type simply "I want a report on XYZ." On the screen would flash "XYZ" and the information in XYZ's file. If the counselor only wanted to review the information (s)he would turn off the machine after reading the information on the screen. QUERY can retrieve only information already in the machine; it does not allow for entry or manipulation of data.

- BASIC (Beginners All Purpose Symbolic Instruction Code)

  BASIC permits not only access, but entry and manipulation of data. It uses English words in a special way and, usually, with very specific meanings. For instance, the request for the XYZ file to be displayed on the screen might be keyed in as:

  ```
  LOAD XYZ

  LIST
  ```

  The first instruction (LOAD XYZ) tells the computer to look for the XYZ file in the external storage area, probably on a disk. Once the computer finds the XYZ file, it is instructed to load the file into the computer's memory, i.e., internal storage. The second instruction (LIST) commands the computer to list on the screen all the information found in the file.

  This simplified example shows that BASIC does the same things as QUERY but with fewer and more symbolic words.

- COBOL (Common Business Oriented Language)

  A widely used language for business application is COBOL (pronounced Coe Ball). It uses few English words, relying on symbols and abbreviations instead.

  The following example illustrates instructions in COBOL for finding the prior balance in a specific account:

  ```
  330820 IF PRIORBAL NOT NUMERIC
  MOVE 'Y' TO YES-NON MOVE

  330822 'PRIORBAL' TO MVLAB
  PERFORM NONNUM-1 THRU
  NONNUM-1-EX

  330824 MOVE ZEROES TO PRIORBAL
  ```

  With some experience, one can begin to understand part of this language.

- FORTRAN (Formula Translation)

  A popular language for research purposes is FORTRAN (pronounced FOR TRAN). This language uses mathematical symbols, such as * for multiply, / for division, and ** for raise to a power. FORTRAN allows scientific calculations to be input into the computer in a form very near that used in mathematics. The following is a FORTRAN instruction for computation of a commission:

  ```
  READ (5,500) AMNT

  IF (AMNT.LE.150.00) COM = 6.00
  ```

IF (AMNT.GT.150.00) COM = 6.00 + .02 * (AMNT - 150.00)

- Assembly

  Assembly is a symbolic language which is one step from machine language. Using the above COBOL example of computing a prior balance the following three lines of Assembly illustrate the symbolic non-English language which provides specific instructions to the computer:

  215 LA R2,@IDTWO(,R9)

  216 LA R1,@PTENDL + PTNEXT(,R1)

  217 B PTM1

- Machine language

  The language the computer uses is called machine language. It uses no letters, only the two numerals, 0 and 1. An instruction in machine language might be "11000011" which tells the computer to turn on the first two switches in the computer, leave the next four off, and then turn on the last two.

The following shows the progression from high to low level languages.

QUERY	I WANT A REPORT ON XYZ
BASIC	LOAD XYZ LIST
COBOL	IF PRIORBAL NOT NUMERIC MOVE 'Y' TO YES - NON MOVE 'PRIOR BAL' TO MVLAB PERFORM NONNUM-1 THRU NONNUM-1-EX MOVE ZEROES TO PRIORBAL

FORTRAN	READ (5,5001) AMNT
	IF (AMNT.LE.150.00) COM = 6.00
	IF (AMNT.GT.150.00) COM = 6.00
	+ .02
	*(AMNT - 150.00)

Assembly	LA R2,@IDTWO(,R9) LA R1,@PTENDL + PTNEXT(,RD1) B PTM1
Machine	11000011

The Relationship of Languages to Computer Hardware - Every computer operates in machine language while most users in the US read and write in English. If a user asks the computer a question in QUERY (COBOL, FORTRAN or any other non-machine language), the computer has a compiler or translator which takes the instruction and converts it into equivalent machine language. Only then can the computer respond to the instruction. The compiler has a program written in machine language but built to look for higher level language instructions and convert them into machine language.

Systems and Applications Software

Computer software is divided into two types: (1) systems software which operates the computer, and (2) applications programs which apply the computer's capability to a user's requirements.

Systems Software - The term software encompasses all computer programs but refers most often to programs which allow the system to operate. Systems software, often called operating systems, manage the housekeeping tasks necessary to make a collection of hardware, languages, and applications programs function as a computer. These system programs have symbolic names such as OS, VOS, and DOS.

Other software systems programs perform general functions as report generators, data base management, and utility programs. The latter function, utility programs, includes such things as duplicating disk files and changing the date in the computer.

Applications Programs - Specific instructions to do a single job for user, such as list occupations by handicapping condition are called applications programs. In business, the most common applications programs are for payroll and inventory control. In vocational rehabilitation, payroll checks are most likely processed on a state payroll applications program. Rehabilitation client and case service data systems are also applications programs and are usually custom designed. In general, custom designed programs are more expensive than the widely available standardized applications packages, because a user pays all of

the development costs. With standardized packages, users share the original development costs with all the other purchasers. Because of the cost and the shortage of qualified programmers, standardized programs will continue to be the more commonly used computer software programs.

Word Processing Software - Applications programs that are not usually considered as computer programs are those used in word processing. Word processors are simply small computer equipment (keyboard, printer, screen, and storage) with software written specifically to meet the needs of an office. Each software package has its own, often catchy, title such as Applewriter (for Apple computers) and Electric Pencil (for Radio Shack computers). There are at least 140 companies selling word processors including such large firms as Exxon, Wang, Xerox, and IBM. Word processing software also can be purchased for a computer so that the computer functions as both a computer and a word processor.

Word processors have special function keys on the keyboard to make their operation easier. For example, most word processors have a special key marked"Center". When pressed it will center a heading in the middle of a page. On computers without specialized keyboards, functions such as centering are done by programming the computer. For example, to center a line using a computer with word processing software, the user might press "CMD" (short for command) and then press an upper case "3". After recognizing this command, the computer in less than a second goes through all the steps usually performed by a typist to center a heading.

The functions of word processing software can be categorized into repetitive letters, standard paragraphs, text editing, and statistical typing.

a. Repetitive letters are the form letters sent to many people at the same time or those used numerous times with only slight changes. With a word processor, a letter can be typed, stored, and printed automatically on command. When several people are to receive the same letter, the addresses can be typed (and stored) as one document and the letter as a separate document. The word processor then merges these two documents automatically and prints the letters with the appropriate address for each individual.

b. Standard paragraphs, sentences, boilerplate language, or phrases can be stored and retrieved as needed from the word processor. For example, a letter to a cardiologist requesting information about a specific client's functional limitations will vary in some aspects, but, for the most part will contain the same, often technical, questions asked for all similar examinations. A secretary could compose a letter by typing the first and last paragraph with information about the client and then retrieve and insert into the letter the stored, standard paragraphs which ask very specific technical questions. The letter is personalized and also technically correct.

c. Text editing refers to major revisions, including deletions, insertions, and rearrangements, within long documents such as technical reports or proposals. Reports can be typed on a word processor, stored on a magnetic disk, and printed on paper as a first draft. This draft is reviewed with the revisions marked right onto the paper draft. The secretary retrieves the draft document from storage, displays it on the word processor screen, and makes the revisions using the automatic functions of inserting, moving, copying, and deleting words, sentences, or paragraphs. This cycle can be repeated as many times as necessary until the document is exactly as needed and the final copy printed.

d. Statistical typing is a difficult chore because of the many columns and the need to proofread all numbers. Word processing software allows the automatic establishment of margins and spacing for columns. In addition, columns can be moved, deleted or copied into another document. To assist with proofreading, some software is capable of adding all the numbers typed in a column to obtain a sum. If this sum is not the same as the sum secured by the originator, then the secretary knows that someone (the originator or the secretary) made an error.

Personnel

Some people are not good at languages and there are some people with a facility for foreign languages. Most people, however, need help and this is where computer personnel come in. When you contact the computer people, you are likely to talk with one of the following:

Manager of Data Processing or Management Information System

Systems Designer/Analyst

System Programmer

Applications Programmer

Computer Operator

Production Controller

Data Entry Person

User or System Owner

In a standard computer operation each of these persons has a particular function and a different scope of knowledge. In smaller computer installations, several or all functions may be done by one person.

Manager

The manager has overall authority for the program and reports, as do the other managers in the organization, to division directors, agency heads, or senior managers. The responsibilities of the manager are to see that the machines operate and the work is completed as scheduled. The skills necessary to do this may not require a detailed understanding of computer systems or programs, but of people. In fact, their knowledge of new equipment or programs may be quite limited. So a user approaching a manager with a proposal for a new computer use may not get a warm reception, especially if the request is for a microcomputer in the field office. Managers traditionally have centralized all operations and equipment to have maximum control and efficiency and it may be difficult for them to decentralize even though it may be less costly and more efficient.

System Designer/Analyst

The system designer/analyst in a vocational rehabilitation agency has a two fold job: (1) to understand each computer's equipment and programs, and (2) to understand the agency's operations in terms of computers. Each piece of computer equipment (terminal, storage, processor, and printer) has fixed, built in limits in terms of number of characters, speed, etc. It is necessary to design the layout and the interconnections of the various pieces of computer equipment for maximum efficiency of output per cost.

Efficiency of operation is necessary both for computer hardware and for the computer operating systems, the set of instructions which operate the computer. Perhaps the most difficult part of a system design is to take an agency's present practice (e.g., creating, storing, and updating client files) and recast these procedures into a system of actions for computerization. And further to design a system compatible with the computer, its capabilities and limits.

When a system designer is building a new system, the user has to make choices regarding the match of the user's requirements and the computer's capability. The results of these choices will be seen only when the new system is "up and running" and the user switches from the old manual systems to the computer. For example, one limitation may be that only one file can be displayed on the screen at one time versus the old method of laying out four files on a table for comparisons.

System Programmer

A system programmer writes out the detailed steps the computer needs to take in order for the user's program to operate. This person's job is to take a given configuration of computer equipment and program it so that various jobs will run on it. In the simplest terms, the system program tells the computer when to run a program, where to find the program stored, and where to print the results.

An analogy may be helpful. In a typical vocational rehabilitation office, each vocational rehabilitation counselor knows the case files are

in a particular file drawer, and a summary is necessary each month which involves, among other things, adding up the number of active cases and writing the total on a particular form. A computer's operating system must know when to look in the files (when someone hits a certain key), which file to pull (get the XYZ file off the disk and into the computer), what program to run (add the number of active cases), and where to display it (on the printer). The operating system does not care what applications program is run, it only tells the computer where to find a particular file, where to put it, when to run the program, and where to print the results. Incidentally, the computer does not have to return the file; it only took a magnetic reproduction of the file and left the file on the disk in an unchanged state.

Applications Programmer

The applications programmer writes out a set of specific instructions for the computer to do a specific job. In the example given above, an applications programmer would write the set of instructions that tells the computer to add up the number of active cases in the XYZ file. This person is consulted when minor modifications are necessary in a program. For example, if the format of a report needs changing, this person would make such changes.

Computer Operator

A computer operator controls the machine, usually can estimate when a program will be run, and, crucially, if the computer is broken down, when it will be running again. The operator stays in communication with the computer through the keyboard. The computer tells the operator which program is running and it may request that a different disk of information be made available for the next program.

Production Controller

This person makes sure that jobs are scheduled in such a way as to make the best use of the hardware, software and personnel. In addition, after a program is completed, the controller is responsible for seeing that the output reaches the right person.

Data Entry Person

The data entry person, formerly known as a keypunch operator, sits at a keyboard with a screen attached and enters data onto a tape or disk, or into the computer itself. In large data centers this person probably is employed full time, but in smaller operations, clerical staff may enter data as part of their regular duties.

User or System Owner

Yes, you as a user of computer information are considered part of the team. If useful information is not created or if paperwork is not reduced, then the efforts of the data processing personnel are for naught. As a user you have an obligation to define clearly your information problem (not the solution, just the problem), communicate that need, and to evaluate the effectiveness of the solution after it is designed.

Chapter 6

The Planning Process

The importance of planning for a new or modified computer system must be placed in historical perspective. In the 1950s a single computer purchase could cost over a million dollars. With this amount of money involved, most companies willingly spent $15 - 25,000 studying the feasibility and utility of the purchase. Today, the power of that million dollar computer can be purchased for around $5,000. Even though the cost for the equipment is reduced, the need for the planning and feasibility study remains, whatever its necessary cost may be.

This chapter will review organizational approaches to planning and discuss the steps an agency needs to take for introducing new technology into the service delivery system.

Organizational Approaches To Planning

One way of characterizing the planning process in VR agencies is based on the role of the organization's members in the process.

The Top-Down Approach

The top-down approach operates as the name implies. Top management analyzes the agency's objectives, and reviews and defines the allocation of resources to further the identified objectives. The next step is the communication of these decisions to the middle managers who refine and add more detail for operational purposes. Descending the organizational structure, the decisions continue to be analyzed and become more and more finite. Other organizational plans, e.g., goal setting and objective specification, follow a similar path down the organization chart.

Historically, the approach to planning in most organizations, public and private, has been from the top down. Critics point out that this has led to technologies being geared to meet the needs of top management. Others dissatisfied with the top-down method suggest that countless reports are generated that are useless to management as well as the practitioner.

The Bottom-Up Approach

Rehabilitation practitioners usually feel that planning in a vocational rehabilitation agency will not enhance client service delivery unless and until it proceeds from the bottom up; that planning must begin by looking at what happens "where the rubber meets the road". In the bottom-up approach, a model plan with the information needed to generate and support decisions is developed at the practitioner level. The model plan is expanded as other needs are integrated at successively higher management levels.

This approach also has some obvious problems. Planning without top management's support inevitably encounters conflicts, sometimes with previously established agency objectives. Once this occurs, the bottom-up plan suffers.

Combining These Approaches

A more successful managerial approach may be a combination of top-down and bottom-up. In the combined approach, the master plan states the organization's objectives. This solidifies the support of top management, which is essential to success of the plan. The specific details of the master plan are then developed starting at the service delivery level. Thus, commitment to the master plan is generated at both the field office and top management levels.

Steps In The Planning Process

Regardless of the organizational approach to planning, there is a series of steps an agency should take to decide on and implement a new or modified computer system:

1. Needs assessment
2. Feasibility study
3. Systems design
4. Testing
5. Training
6. Installation

The process begins with the identification of a problem(s) with the agency's information processing procedures. A needs assessment determines if a system can be developed to solve the problem. If so, a detailed feasibility study outlines alternatives so that a decision to proceed can be made. (Of course, the decision could be to forget about the whole thing.) Systems design involves the analysis of present procedures and the specification of the hardware, software and staff needed for the new system. After software is developed, testing is conducted to ascertain if the system performs as desired; staff is trained in the new procedures and finally the system is installed and operating.

A discussion of each step in the process follows.

Needs Assessment

In a needs assessment, the agency identifies not only needs but service delivery problems that could be alleviated by improved information processing procedures and weighs the urgency and importance of the problems for priority setting. If this critical first step is overlooked or conducted superficially, the result can be the purchase of expensive hardware and the development of complex programs when inexpensive alternatives would work just as well. It is not uncommon for an agency to purchase equipment and then begin to ask how it can be used.

Conducting a needs assessment involves gathering and analyzing data on the information required by the organization, and the information flow within the organization. This will help delineate how the agency functions. Data should be gathered to answer questions such as:

What forms are generated?

What information is on each form?

Who fills out the form?

What happens to the form once it is completed?

How is the information used?

Once there is an understanding of what and how information is collected, the focus shifts to what information the agency needs to have. For example:

What information is needed about the clients? vendors? employers?

For what purpose?

What forms are needed?

What kinds of analyses are required?

The data collection and analysis phase usually cannot be accomplished simply by asking service delivery staff what would help them do a better job. Some will find the current system all right while others would indicate they do not rely on data. Realistically most counselors are not familiar enough with the potential of computers to think creatively about possible applications.

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schedule some pretraining of staff a half-day training session to introduce staff to the computer, its potentials and pitfalls. Such a session would remove the mystery surrounding computers, enable staff to vent feelings, clear up misunderstandings, while at the same time indicating the agency is serious about improving information processing procedures. It would also improve the quality of future input from the staff.

The final step in conducting a needs assessment is the identification of agency problems that the computer might help overcome. Spell out the nature of the problems, their size, how widespread they are and what happens if they are ignored. These problems must then be matched up with the potential benefits a computer could provide such as:

1. Obtaining information previously unavailable
2. Receiving information in a more timely manner
3. Improving operations
4. Performing calculations not previously possible
5. Improving decision making

The specific decision to be made at the conclusion of the needs assessment is whether or not a system can be developed to alleviate identified problems in information processing. If the conclusion is positive, the agency proceeds to the next step in the planning process. If the conclusion is negative, the agency should discontinue its planning.

Feasibility Study

Three primary activities occur at this step in the planning process: development of a plan for the system, specification of alternative methods of achieving the plan and selection of the most feasible alternative.

The system's plan should spell out in general terms what the system should do. It would detail what information is needed, when and why it is collected, i.e., specify the input and output desired. The plan should define the boundaries of the system financial information only, client data, vendor and employer information, etc. When completed, the system's plan should specify the agency's long-range needs and goals for information processing. Procedures do not have to be too detailed at this point although there should be enough information so that anyone examining the plan can understand the technological applications.

The plan serves several purposes. It communicates the needs of the agency, provides for the integration of proposed and current applications within the system, and helps avoid duplication. A new system can be developed while ensuring compatibility with the current one.

Agencies can develop their systems and the technology that goes into them in several ways. Three of the more commonly used approaches are the total management information system, incremental and modular.

Total Management Information Systems Approach - This approach is based on the assumption that all activities in an organization are interrelated and thus the information should be totally integrated. Data from all over the agency are collected, providing a mass of information that can be used for different purposes and for different kinds of processing, e.g., client listings, payrolls, summary reports and management decision support. The problem with this approach is that it is difficult to consider every possible issue of importance to the agency before designing the system, so the final product may not be able to address all of the needs. This approach could also lead to masses of data accumulated at high storage costs, information banks becoming needlessly cumbersome and many reports being produced that are never used.

Incremental Approach - Most often, vocational rehabilitation agencies, like the majority of public agencies, approach system development incrementally. Basically, the philosophy here is to begin with what is currently in place in the organization and then add another application to the system. For example, an agency may have its financial operations on the computer. The decision is then made to add a client tracking system,

followed later by a system of client data files. With the incremental approach, each system is designed and operated separately resulting in redundant forms, increased paperwork and confusing output.

Managers with a pragmatic bent may argue that the incremental approach is the most realistic way to approach planning, that the planners are dealing with the here and now and not wasting time brainstorming approaches that are unlikely to materialize in the forseeable future. The difficulty with this approach is it represents a piecemeal way of meeting agency needs one problem is solved while others are ignored or even made worse.

Modular Approach - The modular approach combines the best features of the management information system approach with the incremental. This approach advocates an incremental, one-step-at-a-time strategy with each step guided by a master plan. A master plan ensures that new applications are compatible with and integrated into the agency's data base. Each new component can address a number of agency needs. The modular approach focuses the agency's attention on what can be done with present staff and resources. New applications can be pursued one by one with the most important needs being addressed first.

With a broad plan in place that outlines where the agency wants to go, planners begin to explore in detail alternative courses of action which might be undertaken. The examination should include the various hardware configurations and software packages available, and a detailed look at the operating system (batch, real time or time sharing), what the system provides (input and output, secondary storage), centralized or distributed processing, kinds of processing available, and additional functions needed (backup system, security). One alternative which should not be overlooked is retaining the present system. Table 2 lists decisions which need to be made regarding hardware and software.

The various alternatives are evaluated on the basis of criteria established by the planners. Such criteria would include agency constraints in terms of money and staff resources, the advantages and disadvantages of each alternative, the cost-benefit of each plan including the system's operating and initial costs, the agency's priorities and the impact of each alternative on the organization and its subunits.

In looking at the different options, the planners should review what has been done elsewhere. If another VR agency has developed a similar system, it can be used as a model or to assist in design. If the search reveals no similar service delivery system and there is no internal experience available, the planners are advised to rely on a systems consultant rather than computer sales persons.

Table 2
Management Decisions on Technology

	Decision area	Examples of Alternatives
Hardware	Selection of technology	Batch or on-line system
	Equipment selection for an entire system	General-purpose or mini-computer
	Selection of specific devices	Terminals
Software	Choice of languages	Planning language
	Acquisition of packages	Statistical analysis package
Files	Capabilities of application	Direct access or sequential file organization
	Response time of application	On-line or batch processing
	Selection of data base management system	Various data management packages available
Sources of services	Hardware	Service bureau, internal facility
	Software	Consultant, internal staff, packages

From: H.C. Lucas, Jr. Information Systems Concepts for Management. NY: McGraw Hill, 1978, p. 90.

In conducting a feasibility study, all options available to help meet the stated goals should be reviewed, their advantages determined, and the cost of the options determined. In addition to money costs, there are other costs in time, effort, and morale.

At the end of this planning phase, a tentative decision should be reached on the hardware configuration and the software packages needed to accomplish the specific objectives and their costs. With this in hand, the systems design can be developed in detail.

Systems Design

The initial plan set forth systems goals for the agency to improve service delivery operations. The feasibility study revealed what tools are needed to reach those goals. Now the planners must design the specific system in detail.

At this point, objectives are needed for achieving each of the goals that have been developed. These objectives must be realistic statements of what will be done. The action steps set forth who should do what and when, thus specifying the strategies, priorities, sequence, and timing needed to execute the plan. For example, the planners need to address the following questions: What items of information about the client, vendor or employer, collected by whom and when, should be entered on which forms? Who will enter data on the machine? Who is responsible for operating the machine? How will they be trained and their activities supervised? What information, processed how, should be routinely reported to whom in what format and when? Such questions will help the planners specify the actions and tasks necessary to meet the objectives. It is the goals, objectives, actions, and tasks that then make up the systems plan.

The planners also must be concerned with decisions relating to acquisition of computer hardware and software. Based on the previously developed plan, the agency should prepare a written request for proposals. This request is sent to various vendors, who in turn propose equipment. Information contained in this request should include a description of the desired input and output, potential maximum volume of the system, acceptable turnaround time, types of processing needed (calculations, counts), amount and accessibility of storage. In summary the request for proposals should provide a detailed picture of what the system is to do.

The agency has three alternatives in acquiring a system:

1. Buy a system and use it as is
2. Buy a system and modify it
3. Assemble hardware and software and develop programs from scratch.

The probability of obtaining an "instant" system is small. Most systems require modification to meet the agency's needs. This can be written in as part of the contract with the vendor or can be done in-house if the expertise is available. Should the agency choose the third alternative -develop the system itself - the work may be contracted out to a systems developer or may be performed by in-house software development personnel. The agency may end up with a tailor made system but it also will have invested considerable time and money to achieve it.

The systems design phase is crucial to the successful implementation of computer technology within the agency service delivery system. This phase will probably consume months, if not years, of the agency's attention. Everyone whose job is affected by the new procedures should review the design, understand it and have a chance to suggest modifications. (See Appendix F for two case studies of implementation in VR agencies.)

Testing

> It is fair to say that few computer systems work right the first time; few programs run right the first time; few office procedures run smoothly when first implemented, and new forms are never free of ambiguity. The system needs to be tested, modified, retested, remodified — in the jargon of the trade, "debugged". (Taylor and Gibbons, 1980)

Before the new system is put into operation, all parts of the system should be tested with sample data, separately and together, to see that they perform as expected. Test runs should be conducted until it is verified that the system works satisfactorily.

It is during this phase that manuals are prepared describing what each program does, how it works, and what the output provides. Agency staff can use the system only if the procedures are clearly spelled out.

Training

Since one purpose of the new system is to change existing procedures, training of staff is crucial. All individuals have to understand what the new system requires. Anxieties and fears about the computer are likely to reappear at this time. But the more staff has been involved in previous steps of the process, the less severe the problem is likely to be at this stage.

Installation

Conversion and installation of the system occurs next, and should be phased in if at all possible. That is, one department or geographic area could be converted first by creating the initial files for the new system. With the new system beginning operations, many agencies discontinue the old manual system. This could be a fatal mistake. It is difficult to be sure that a system is performing fully as designed. The best procedure is to run both manual and automated systems until the new system is performing smoothly. The agency should, of course, have backup computer procedures which can be used to recover from an disruption or failure in the system. Such procedures could include periodic printing of cumulative data, copying of all data into secondary storage (disks or tapes) or a duplicate system using a different magnetic medium.

Good planning is part art, part science. To the persons responsible for planning the incorporation of a new technology into an agency's service delivery system, the following advice is given:

- Check to see if someone else has already done this. Avoid re-inventing the wheel.
- Recognize that full systems development will probably take years.
- Use the modular approach to systems design.
- Be extremely careful with the initial specifications. While consultants can be used, the bulk of the work should be done internally.
- Be alert to organizational dynamics. Watch especially for changes in the balance of power and radical changes in communication channels (See Chapter 7).

The success of the plan developed will turn on the content of the plan and its acceptance by staff.

Human Aspects of the Planning Process

It is commonly believed that in order to develop and install a computer system, a systems analyst must be in charge; that the analyst alone has the tools and techniques for designing the system. While technical expertise is important in the development of computer-based systems, it is the users' reactions which determine the success of the system. Thus it is recommended that the agency's staff (users) be responsible for the design of the system with technical assistance from the computer professionals. The costs of staff time invested in the planning process is more than recovered in improved system design, the speed of acceptance and implementation.

Lucas (1978) has outlined and described the roles of users and computer experts in each stage of the planning process.

Table 3
Responsibilities During the System Planning Cycle

Stages	Responsibilities of Users	Responsibilities of Information service staff
Inception	Initiate study, suggest application, sketch information needs, describe existing processing procedures	Listen to requirements, respond to questions, devise alternatives, assess using rough estimates, prepare preliminary survey
Feasibility study	Help evaluate existing system and proposed alternatives, select alternative for design	Evaluate alternatives using agreed upon criteria
Systems Analysis	Help describe existing system, collect and analyze data	Conduct analysis, collect data, and document findings
Design	Design output, input, processing logic; plan for conversion and forecast impact on users; design manual procedures; remain aware of file structures and design	Present alternatives and tradeoffs to users for their decisions
Specifications	Review specifications, help develop specifications for manual procedures	Combine user needs with technical requirements to develop specifications, develop technical conversion plan
Programming	Monitor progress	Organize programming, design modules, code programs
Testing	Generate test data and evaluate results	Test program modules individually and in entire system

Training	Develop materials, conduct training sessions	Aid in preparation of materials and train operations staff
Conversion and Installation	Phase conversion, provide resources, conduct post implementation audit	Coordinate conversion, perform conversion processing tasks, help in postimplementation audit
Operations	Provide data and utilize output, monitor system use and quality, suggest modifications and enhancements	Process data to produce output reliably, respond to enhancement requests, suggest improvements, monitor service

The user initiates the preliminary survey by suggesting a potential application. The information services department responds with a rough estimate of its desirability and with several alternative systems, e.g., improvements to present information processing activities, a batch system, a package, or an on-line system, each meeting some percentage of user needs. A preliminary survey evaluates each alternative on criteria developed by the planning committee. The planning committee authorizes a feasibility study, possibly eliminating some alternatives suggested in the preliminary survey.

The information services department staff conducts the feasibility study with help and advice from users. Users conduct an analysis of the existing system and help the information services department evaluate various alternatives on criteria specified by the planning committee. The planning committee selects an alternative for implementation. Possibly the committee chooses the alternative of no new system, in which case the application may be held in abeyance until changing conditions make it feasible.

If the decision is to proceed with the development of a new system, users and the information services department staff collaborate to analyze the existing system. Users aid by explaining existing processing procedures and providing data. The computer staff uses this information to document the existing systems and help establish the boundaries of a new system.

Next the design of a new system begins. Users design their own output and input and basic processing logic. The information services department acts as a catalyst, presenting alternatives for users to consider. A plan for conversion, including a forecast of the impact of the system on all potential users, should be developed. A conversion plan can be started at this point, and users design manual procedures.

The information services staff develops detailed specifications based on the logic and requirements specified by users; the staff also prepares a technical conversion plan. The users on the design team review the technical plans and also work on the development of specifications for manual procedures.

The user role during programming is one of monitoring progress. Are modern techniques being used to manage programming? Is a project schedule maintained and are resources reallocated as necessary to achieve installation on schedule? However, the bulk of the responsibility during this stage rests with the information services department. The staff has to design programming modules, code them, and test them individually and in combination.

During testing, users should define data for test programs. An attempt should be made to generate some data with errors to be sure the system will catch them. Users should carefully examine test results and evaluate the adequacy of processing. Some kind of acceptance test should also be conducted by the information services department and the results evaluated by users. A parallel test of old and new procedures or pilot studies may be used for this purpose.

Training is essential for smooth conversion and installation. Users develop materials and actually conduct the training sessions. Training can often be combined with testing; the preparation of test data serves to help train users. The information services staff aids in the preparation of materials and has the responsibility for training the operations staff.

Finally, during operations, users furnish data for input and work with the output. The user will probably suggest enhancements and modifications to the system over time. The information services department processes the data to produce output reliably, as scheduled. The information services department should also look for improvements itself and respond to modifications suggested by users.

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Chapter 7

Preparing For Change

A computer system will substantially change things within an agency. Obviously, the impact of the system on the agency and its environment should be looked at before proceeding. It is unrealistic and self-deceptive to pretend introduction of a new system will be painless, cheap or totally satisfactory.

Although it may appear possible and necessary to increase automation, the cost of such a move may prevent its implementation. Even though it is widely believed, there is little evidence to support the idea that computer systems save money. A more realistic hope is that costs can be contained at the current level.

If costs are not prohibitive, there are other constraints inherent in the computer which must be understood prior to successful implementation. Computers are unable to do some things that people find easy to do: use associative reasoning, retrieve relevant past experiences, distill the essence from a mass of data or make intelligent guesses of solutions to problems.

A great deal of information can be stored in a computer's memory, but the computer can't locate it unless it is told by a person where to find it. In addition, computers cannot make qualitative evaluations of information nor comprehend relationships between multiple pieces of data.

The failure to understand the limitations of the technology can seriously hamper successful implementation.

Minimizing Staff Resistance

Every person who works with the computer system, even indirectly, is part of the system and will be affected by it. Conversely, each person will affect the system. The way the system affects individuals has an important bearing on its success or failure.

Many authors contend that inadequate utilization of technology is primarily a function of users' resistance or inability to understand the new innovation (Danzinger, 1977). The truth is there are many things inherent in the computer and its implementation into the agency which make staff acceptance difficult.

Information in a tangible, physical form is what most persons are comfortable with. When information goes directly into a computer and is viewed later on a TV screen, no physical form is associated with the data. It is, therefore, not surprising that most people feel insecure in casting their lot with the computer. Intellectually, they can accept that the data are there, but it requires a considerable act of faith.

Further, communication with the computer must be on its terms. Information must be classified, categorized and quantified before it can be processed. The format of the computer printout may leave much to be desired. One frequently has to scrutinize and work diligently to extract the desired important information.

Along with the constraints imposed by the

technology, there are staff attitudes and fears which cannot be ignored. Some of the more common negative feelings are:

1. The computer will replace workers.
2. Clients will be dehumanized.
3. Worker discretion and autonomy will be decreased or eliminated.
4. The money should be spent on clients.
5. Less time will be spent on clients.
6. More work to do with less results.
7. Errors made by computer will never be corrected.

Staff resistance can be created by certain blind spots and attitudes which the planners have in their preoccupation with the technical aspects of the system. They become so engrossed with the technology that they can become oblivious to the things that bother people, the human factors involved in the transition.

Resistance also can be generated because the know-how of the field staff is overlooked. The field staff are experienced specialists and can spot practical difficulties in the system before it is too late. Ideally, planners will seek field input before they progress too far in the planning process. This will allow the field staff to conscientiously and methodically sift through every aspect of their work, thereby improving the proposed changes, with explicit and detailed suggestions for incorporation into the system. The resistances on both sides would then be kept to a minimum.

Top and middle level managers should realize that preparing the organization for the technological change is perhaps the most important factor in successful implementation. They must facilitate communication and understanding within the organization. All parties need to understand and respect the fact that the system developers and the users have different goals, outlooks, languages, time perspectives and styles of operation. Staff will normally resist change, subvert innovations and persist with current operating procedures.

An important element in implementing the new technology is staff acceptance of change. That acceptance can be enhanced if people know why a change is needed or wanted. The reasons may be economic, or geared toward improvement of a work situation, but the reason is an important factor in acceptance and utilization by the people involved (Senn, 1978).

What employees generally resist is not technical change but social change, i.e., the change in relationships or in the way they do their jobs. Managers must be concerned with the prevailing values, attitudes and traditions of the organization and its staff. There must be an understanding of which social arrangements and job functions will be sustained or changed. If a well established work group is disrupted, a new one should be facilitated. Employees whose careers are disrupted should be counseled. If a job is altered, a new job definition is required. Management should use as a resource, persons who work closely with field staff and understand the existing relationships. Field staff will probably respond positively to these individuals whereas any action by other central management may be perceived as change imposed from outside.

There needs to be give-and-take between all staff. Each individual has valuable skills and knowledge. Securing employee participation in implementing changes is axiomatic in management, but participation cannot be created artifically. Employee participation cannot be used as a device to sanction management decisions. Real participation is based on respect.

Employees need a working knowledge of the technology to be implemented. Often such information is transmitted in complicated and technical terms which leaves most employees confused and frustrated. The failure to provide adequate explanations can mean a job previously performed with satisfaction and understanding will now be performed without concern and with less productivity. It is often ignorance that leads to the misuse of technology.

The costs of a good training program are often overlooked in implementation planning. These costs are a worthwhile investment, however, when weighed against the costs of an unsuccessful implementation experience. Training

materials should be packaged for staff at all levels in the agency. If a consultant is used, this responsibility should be built into the contract. The materials should be user-centered, which can be assured by including a training specialist in the development of the materials. Another excellent strategy is to select those employees who are ready to accept the innovation to play a leadership role in introducing the innovation to fellow employees.

Consultants

One decision that needs to be made during planning or implementation is whether or not to call in a consultant for assistance. A consultant should be considered only after the problem to be solved has been clarified or defined, and the strategies for solution have been generated. In general, consultants should not be used unless they are clearly the best solution under present conditions. Limited resources can be utilized more effectively in the future by building the agency's in-house technical capacity. That is not to say that outside consultants should not be used. The agency may consider a consultant when:

- a task is to be performed once and outside private groups are equipped to accomplish the task;
- fresh input is needed; or
- the skills needed require a higher salary than the agency can pay.

If a consultant is brought in, there are several things that may have to be dealt with:

- they can upset routines;
- they can provide poor advice;
- they can overextend budgets;
- they can create a dependence on themselves;
- they do not know the organization or the environment.

There are also social dimensions to consider as the personality of the consultant and the tasks performed by the consultant could exacerbate existing problems in an agency. But it is also important to recognize that the consultant provides knowledge where and when it's needed, brings innovation to the agency and has expertise in solving problems within organizations and programs.

The contract negotiated with the consultant is a key factor in assuring the success of the project. The phrasing of the contract is especially important for it establishes the base for utilization, monitoring and evaluation. The more specific the contract, the less likely there is to be any misunderstanding. Items that should be addressed in the contract include:

- schedule for fees and payments;
- schedule for completion of elements; amount of organization staff time to be committed;
- type and nature of reports to be submitted;
- professional liability insurance;
- nonassignability of contract;
- official overseeing and approving changes, subcontracts;
- control and use of reports;
- kinds of individuals consultant will assign;
- performance bonds for major design work;
- conditions for cancellation.

If a consultant is used, the manager has to invest adequate time and resources to assist the consultant. Each organization's situation has a unique set of conditions, and even if the task definition has been clarified properly, the consultant is not going to be able to foresee all of the contingencies. They will need information and direction, but excessive leadership and/or task demands may undermine effective implementation. The manager must be careful lest the consultant assumes management responsibility.

Effective utilization of the consultant depends on the ability of management to develop an accurate perception of the task to be accomplished, to choose a consultant who is equipped to do the task and to create the machinery and organizational environment which will promote the success of the plan. Finally, management must be ready to accept responsibility for a poor product should that be the result.

Privacy And Security

When planning and implementing an informa-

tion system which involves client data, precautions must be taken to insure privacy and security of the data. This is true for manual as well as computer systems, but the potential for abuse is greater with the computer. Client records on computers are better organized, more visible and more available than manual records.

Privacy refers to the right of individuals to determine to what extent information about them can be transmitted to others. Security refers to the protection of data against disclosure to unauthorized persons or unauthorized modification or destruction. The breach of privacy or security can be accidental or premeditated.

Since client information travels a lengthy path from collection to storage, privacy and security involve at a minimum employees, procedures, records, equipment and printouts. Control measures must be carefully thought through and implemented systematically. Controls fall into three categories: physical, technological and administrative.

Physical controls include such things as segregation of computer operations from the surrounding office environment, locked rooms, locked terminals and cabinets, and client-sensitive papers covered or locked up. Control of the technology can be enhanced by user identification codes which are changed frequently, terminal identification numbers and limiting user access to specific data bases, e.g., statistical data, individual caseload, demographic information or financial data.

Administrative controls primarily involve monitoring reports and verbal feedback to assure the system is operating properly. Monitoring should consist of procedures to track disclosures of client information, which can be handled by a disclosure log. The kind of information collected in the log would be:

- date and time of disclosure;
- type of transaction;
- user access code;
- client identifiers.

The control measures which are instituted should be designed to:

- prevent unauthorized access to client information;
- limit access to users on a need-to-know basis;
- provide monitoring of access.

Monitoring, Evaluating And Maintaining

The new computer system is operating but much remains to be done. No system operates perfectly and the resultant high frustration level of staff must be dealt with. Users will lack insight into the range of capabilities of the technology while the technicians will probably find the system significantly less than anticipated. There is a real danger that the frustrations will turn into permanent disgust.

Managers must work closely with staff during this period. Staff skills must be increased. The bugs in the system need to be worked out. Communication between users and technicians needs to be direct and continuous. And system modifications should be made to accommodate unforeseen problems.

Close monitoring of the implementation process is required. Managers need to be aware of major delays and potential cost overrun. They should insist on sufficient documentation to identify problems and evaluate the system.

The managers need to be on the lookout for new and expanded activities being undertaken by the agency using the new technology. Initially the computer will be underutilized and technical staff may be inspired to initiate new projects which could result in an unnecessary burden on field staff and the system itself.

Frequently overlooked in implementing a new system are the costs of keeping the system going. "Finished" is a word seldom spoken as requirements often change before the implementation is completed. Parts of the system, such as specific hardware items or particular programs, need replacement or expansion to cope with increasing workloads or changing applications. Such software maintenance often represents 50 to 80 percent of the ultimate investment in the system (Covvey and McAllister, 1980). However, the failure to consider growth and change will

result in a system that costs everyone but serves no one.

For good or ill, a computer system will substantially alter the agency's way of doing business. This is not necessarily bad if the effects are anticipated and adequately planned for. Stripped of their mystery and the erroneous idea that they can solve every problem, computer systems emerge as a mixture of hardware, software and people - another tool for service delivery.

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Glossary

Acoustic Coupler - A device that allows electronic devices to communicate by making and listening to sounds over a telephone.

Analog Computer - Computer that performs operations on continuous signals, such as voltage fluctuations, waveforms, etc.

Applications Programmer - A person who writes out a set of specific computer instructions to do a specific job.

Applications Software - Specific programs that apply the computer's capability to a user's requirements. May be supplied by the manufacturer, purchased from a software house or written by the user.

Assembly Language - Language which uses codes and symbols to input data to produce machine instructions.

BASIC - Computer language which permits not only access to but entry and manipulation of data.

Batch Processing - A number of similar data input items grouped together and processed at one operation.

Baud - A measure of the amount of information transmitted in a given amount of time, usually bits per second.

Bit - The smallest unit of information recognized by the computer. One of the two digits of a binary number (0 and 1).

Black Box - Slang term for central processing unit.

Byte - A sequence of adjacent bits (usually 8 or 16) operated on as a unit to form a single character.

Cathode Ray Tube (CRT) - In practice, a TV set or any television screen display.

Central Processing Unit (CPU) - The part of the computer which controls all other parts of the computer and where processing or computation is performed. Its components include the arithmetic/logic unit, control unit and internal memory.

Characters - The letters, numbers or spaces used to convey information.

COBOL - Computer language of symbols and abbreviations widely used in business applications.

Computer - A calculating device which utilizes electronic circuitry, has a memory for storing large amounts of data and which can produce or retrieve it on demand.

Computer Assisted Instruction (CAI) - A component of computer based education in which the computer directly assists in the teaching and presentation of learning materials.

Computer Based Education (CBE) - 1) The use of computers in an educational environment. 2) Any teaching or learning activity that makes instructional use of a computer.

Computer Managed Instruction (CMI) - A component of computer based education in which the computer manages student instruction, testing, record keeping, and study prescriptions.

Computer Operator - The person who controls the machine and can usually estimate when a program will be run, and if the computer is broken, when it will be running again.

Computer Program - A set of instructions to the central processing unit describing exactly and in enormous detail what is to be accomplished.

Daisy Wheel Printer - A printer where the individual characters are hit by an electronically controlled hammer-wheel.

Databank - A computerized collection of information (file) assembled in one place.

Data Entry Person - The individual who sits at a keyboard with a screen attached and enters data onto a tape, disk or the computer itself.

Digital Computer - One that performs calculations and manipulates data composed of whole numbers or integers.

Disk - A circular magnetic surface for storage of information.

Display - Text, line drawings, graphs and animations, in any combination, shown on a screen.

Distributed Data Processing - Dispersed control and responsibility to departments rather than all computer functions housed in a central department.

Dot Matrix Printer - A printer where each character printed is a combination of very small dots.

Dumb Terminal - A terminal which takes information in through a keyboard, transforms it into a telephone signal and sends the information to a computer. It does not possess any processing capability — sends and receives only.

EDP - Electronic data processing.

Electronic Mail - The delivery via electronic means of messages that would otherwise be transmitted physically through the postal system or verbally by telephone.

Facsimile Transmission - A document is scanned at the sending station and a copy transmitted by radio wave or telephone line to a receiving station in a matter of minutes.

Floppy Disk - A small, inexpensive magnetic recording disk that is thin and flexible.

FORTRAN - Computer language for research purposes which allows scientific calculations in a form near that used in mathematics.

Hard Copy - A printed copy of computer output.

Hardware - The equipment which makes up the computer system and associated communication links.

Information - The meaning that a person assigns to data by means of known conventions used in its representation.

Information System - The network of all communication methods within an organization.

Input - Information fed into the computer.

Intelligent Terminal - A terminal containing a microprocessor which allows calculations or reordering of information before sending it to the computer.

Interactive - Systems (e.g., terminals, word processors) that communicate with computers.

Interface - Electronic components that allow two different devices to communicate.

K - Kilobyte; 1000 bytes.

Keyboard - A simple input device for the computer.

Line Printer - A printer that prints an entire line at one time extremely rapidly.

Machine Language - The language that can be directly interpreted by the computer. All other languages must be translated to machine language by the computer.

Magnetic Bubble Memory - Memory contained on tiny magnetic regions that can be created, destroyed and moved about. Retains information even if the external power source is removed.

Main Frame Computers - Come in small, medium and large sizes. The small main frames are faster and larger (in terms of memory) than minicomputers. More importantly, they can also share their computing time with a number of terminals so that the computer user at each terminal can interact with the program as it develops. Medium and large main frames also can do multiple programs at once and can communicate with other machines in order to maximize the work done by all the CPUs.

Management Information System - An organized method of providing past, present and projected information, related to internal operations and external intelligence, supporting the planning, control and operational functions of the organization.

Manager, Data Processing or MIS - Person with overall authority for the unit who is responsible for seeing that the machines operate and the work is completed as scheduled.

Memory - Internal storage built into the computer, referred to as primary storage.

Microcomputer - These have larger memories than microprocessors, up to 48,000 characters, and a complete built-in set of input/output instructions. The number of characters the CPU handles at any one time is quite small and the speed of the CPU in and out of memory is slow.

Microprocessor - The smallest computer with a very small memory and a limited set of built-in input/output instructions. Development of the microprocessor revolutionized the computer industry making computer systems available at relatively low costs.

Minicomputer - Computer which uses characters in small groups, has larger memory (64,000 characters) and the ability to handle about six terminals.

Modem - A device which changes the computer's output signals so they can be transmitted over telephone lines (from digital to analog signals and back again).

Multiplexer - Device that mixes data coming from or going to low speed devices (terminals, word processors) and sends it along one high speed line.

On Line - User is dealing directly with and under the control of the computer through or by cable.

Output - Information transferred out of the computer.

Printer - A device capable of producing hard copy in printed form from a computer.

Query Language - A set of commands (in close to everyday language) employed by a user only to extract data already in the computer.

Real Time - The processing of information at the time the data are created, allowing for the results of the processing to be available fast enough to influence the creation of data.

Software - The specific instructions to the computer, i.e., the complete sequence of machine instructions and routines necessary to implement an action.

Storage - A device (or portion of a device) that receives data, retains it and supplies it on command.

System - An organized collection of resources or components with common goals.

Systems Analyst/Designer - Designer of the layout and the interconnections of the various pieces of computer for maximum efficiency. Requires knowledge of all computer operations equipment and programs, and the agency's operations in terms of computers.

Systems Programmer - Person who writes out the detailed steps that the machine needs to take in order for the user's program to operate.

Systems Software - Manages all the housekeeping tasks necessary to make a collection of hardware, languages and applications programs function as a computer.

Telecommunications - Communication at a distance by cable, radio, telegraph, telephone or television.

Terminal - A device which allows the user to interact directly with the computer. It usually consists of a keyboard, a typewriter-like printing mechanism and/or another display device called a screen for output.

Thermal Printer - Printer with a special silvery paper on which characters are "burnt" electronically.

User - The person who uses the computer's information output.

Word Processor - Computer equipment with software and programs written specifically to meet the needs of an office.

Word Processing - Transformation of ideas and information into a readable form of communication through the management of procedures, equipment and personnel.

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Appendix A

The Pennsylvania Bureau of Vocational Rehabilitation Automated Information System

The Pennsylvania Bureau of Vocational Rehabilitation has initiated an on-line data system which has many features to make information readily accessible to counselors and thus facilitate the rehabilitation process. Although it is not the only on-line system, it is presented here as an example of the new data systems that are beginning to appear in rehabilitation.

The Bureau has computer terminals and printers in all units throughout the state, plus one at the state-run rehabilitation center. Every counselor and secretary has access to a terminal. Report formats are established by the state office staff. Samples of the available reports, their use, an explanation of the codes, and the access codes are available to the staff. When a certain report is needed, a simple code is input and the counselor receives the information pertinent to his or her caseload. A counselor may choose to receive the report on a printout or by display.

Information on clients is input via the terminal in the unit and all records are updated when the information is received. Summary fiscal information is current to that date, but individual client fiscal information does have a two week delay.

Although ad hoc reporting is not available to field staff through a terminal, special requests may be submitted to the central office where the information is secured through statistical packages such as Statistical Analysis Systems.

The following is only a sample of some of the reports available to counselors and supervisors.

```
*********************************************************************************
*                                                                               *
*  CLIENT'S NAME AND NUMBER  R-DT B-DT DIS RS UNLIQ $  VO FD SDSI TR-DT REVW CS MS *
* FFFFFFFF  DONA  2------5  0379 1157 53- 50      .00    1                 00 01 *
* FFFFFFFF  JOSE  1-------6 1277 0660 381 14  3471.52 71 1       039XX 08/9 18 05 *
* FFFFFFFF  MART  2------9  1277 0960 381 79      .00 13 1       098XX 10/9 39 06 *
* FFFFFFFF  TERR  1-------5 0777 1154 689 79  2711.50 20 1       054XX 10/9 19 04 *
* FFFFFFFF  EDWA  1-------6 0477 0160 660 72  2900.40 90 2 * 9   032XX 03/0 16 12 *
* FFFFFFFF  JERR  1-------8 1278 1052 146 40      .00 20 8     1       02/0 16 02 *
* FFFFFFFF  ROSE  1-------7 1078 0343 660 79      .00 20 1               12/9 22 01 *
*                                                                               *
* ----------1---------- -2-- -3-- -4- -5  ---6--- -7 8 9 10- --11- -12- 13 14 *
*                                                                               *
*********************************************************************************
```

REGULAR ALPHABETIC PRINT-OUT

AUTOMATIC PRINT ENTRY CODE.. VR 37 XXX
DISPLAY ONLY ENTRY CODE..... VR 39 XXX

THE VR 37 AND VR 39 CODES WILL PRODUCE A CLEAR, CONCISE ALPHABETIC PRINT-OUT OF BASIC CLIENT INFORMATION ON ACTIVE CASES.

PLEASE ASSOCIATE THE FOLLOWING INFORMATION TO THE NUMBERS DESIGNATED IN THIS EXAMPLE FOR COMPLETE COLUMNAR EXPLANATION.

1. CLIENT'S LAST NAME, FIRST NAME AND CLIENT NUMBER

2. REFERRAL DATE - MONTH AND YEAR

3. BIRTH DATE - MONTH AND YEAR

4. MAJOR DISABLING CONDITION UNLESS IN STATUS 00 OR 02, THEN IT WILL BE THE DISABILITY AS REPORTED

5. REFERRAL SOURCE

6. TOTAL UNLIQUIDATED ENCUMBRANCES

7. FIRST TWO DIGITS OF THE JOB OBJECTIVE

8. CURRENT FUND CODE

9. IF CLIENT HAS BEEN CODED SEVERELY DISABLED AN ASTERISK WOULD BE LOCATED IN THIS POSITION. BLANK IF OTHERWISE.

10. SSDI AND SSI CONTROL CODES. UNDER THE 'D' POSITION--SSDI CONTROL CODES. UNDER THE 'I' POSITION--SSI CONTROL CODES. IF CLIENT IS NOT RECEIVING SSDI/SSI COLUMN WILL REMAIN BLANK.

11. TRANSFER DATE. IF CASE WAS IN SUPERVISION AND RETURNED THE 4 DIGITS WITH A '/' INDICATES DATE CASE WAS TRANSFERRED BACK FROM SUPERVISION. IF THERE ARE 5 DIGITS WITHOUT A '/' THIS INDICATES CASE IS CURRENTLY IN SUPERVISION.

12. ANNUAL COMPREHENSIVE REVIEW DATE. THIS DATE INFORMS COUNSELING STAFF WHEN THE FEDERALLY MANDATED ANNUAL COMPREHENSIVE CLIENT REVIEW (AS EXPLAINED IN THE IWRP SYSTEM) IS DUE.

13. STATUS CASE IS CURRENTLY IN

14. MONTHS IN CURRENT STATUS

```
*****************************************************************************
*  VR 01 1-------6                  08/26/78                                *
* FFFFFFFFF      JJJJJJ       CUR. STATUS 18  MONTHS  09      DIST. 01  COUN. 1XX *
* 44444 MAIN ST               MAJOR  381  SECONDARY  999      TRANSFER DATE 08/78 *
* LEWISTOWN          17044    SEVERELY DISABLED       NO      SUPV DO 03 COUN 9XX *
* --------------CASE MOVEMENT--------------     -------FUND CODES---------- *
* 00 02 06 10 12 14 16 17 18 19 20 22 24 29 39 OS CURRENT FD 1 2 3 4 5 6 7 8 9 *
* 00 02    06 02          09                 01 12          1 1               *
* ----REFERRAL  DATA----  -----ACCEPTANCE DATA------  -------CLOSURE DATA----- *
* REF-DT 12/77 DOB 06/60                FUND CODE 1  REF BY SSA YES  CL TYPE  *
* SEX 1 DIS REPORTED 38- SSDI  0   SSI  0   RACE  1  SSDI      SSI      SUM    *
* SOURCE 14     COUNTY 44 DT REF PROC COMPLETE 02/78  DATE FE COMPLETED       *
* DISTRICT   REFERRAL 01 PREV CLOS  NO  MO SINCE     DATE OF CLOSURE          *
* COUN. AT  REFERRAL 1XX MARITAL STATUS 5 DEPEND  0  FROM STATUS      REASON  *
* -----CONTROL CODES---- NO. IN FAM 3 HIGH GRADE 11  WORK STATUS  EARNINGS    *
* SSDI          SSI      PA-TYPE 0  AMT 000 TIME  0  OCCUPATIONAL CODE       *
* -----COST DATA-------- PRIMARY SOURCE SUPPORT  01  P.A.  TYPE      AMOUNT   *
* ALL COSTS         3234 TYPE OF INSTITUTION     00 *****SERVICES PROVIDED**** *
* FACILITY             0 SUM OF FEDERAL PROGRAM 000 10-     13-     16-     19- *
* TRUST FUND           0 DISTRICT AT ACCEPTANCE  01 11-     14-     17-     20- *
* SSI                  0 COUN. AT ACCEPTANCE    1XX 12-     15-     18-     21- *
* UNIT                 0 ----------------------  ------------------------------ *
* UNLIQ.         1048.82 CURRENT VOC. OBJ.  1  7123 PHONE NUMBER      0000000  *
* FIS YR EXP     3159.28 FIRST VOC. OBJ.       7123 IWRP REVIEW DATE   08/79  *
*****************************************************************************
```

CLIENT MASTER FILE

ENTRY CODE VR 01 XXXXXXXXX

THE CLIENT MASTER FILE IS A STATISTICAL REPORT OF CLIENT DATA COMPILED LARGELY FROM THE INFORMATION SUBMITTED ON THE CLIENT'S REFERRAL, ACCEPTANCE AND CLOSURE PORTIONS OF THE SVR-300.

THE ADDITIONAL DATA FOUND ON THIS REPORT HAS BEEN INCLUDED TO MAKE THIS AN EASILY READ, CONCISE REPORT ON A PARTICULAR CLIENT SO AS TO ELIMINATE UNNECESSARY RESEARCH AND LEAFING THROUGH CASE FILES TO OBTAIN CLIENT DATA.

LISTED BELOW YOU WILL FIND A FEW IDEAS OF WHAT CAN BE LEARNED FROM THIS ONE REPORT IF READ EFFECTIVELY ASIDE FROM THE STANDARD REFERRAL, ACCEPTANCE AND CLOSURE INFORMATION.

1. BY REFERRING TO COUNSELOR NUMBER LISTED AT TIME OF REFERRAL AND ACCEPTANCE IN RELATION TO CURRENT COUNSELOR, YOU CAN DETERMINE IF CASE HAS BEEN RESIDENTIALLY TRANSFERRED.
2. BY REFERRING TO 'CASE MOVEMENT' YOU KNOW HOW MANY MONTHS CASE WAS PERHAPS IN PHYSICAL RESTORATION OR A TRAINING STATUS.
3. BY REFERRING TO THE 2 VOCATIONAL OBJECTIVES LISTED YOU CAN DETERMINE IF CLIENT HAS HAD A CHANGE FROM THE ORIGINAL VOCATIONAL OBJECTIVE ESTABLISHED.
4. THE COST DATA IS DISPLAYED GIVING 'ALL COSTS' TOTAL AND AN ADDITIONAL BREAKDOWN BY FACILITY, TRUST FUND, SSI AND UNIT COSTS ALONG WITH UNLIQUIDATED ENCUMBRANCES AND FISCAL YEAR EXPENDITURES.

THE CMF IS DISPLAYED ON THE COMPUTER FOR STENOGRAPHERS AFTER AN INVALID SOS, REFERRAL, ACCEPTANCE OR CLOSURE IS ENTERED. THIS HELPS TO ELIMINATE UNNECESSARY ENTRIES OF INVALID TRANSACTIONS AS STENOGRAPHERS CAN REVIEW ALL THE INFORMATION ON THE CMF TO DETERMINE WHY TRANSACTION WAS INVALID.

```
*****************************************************************************************
*    VR 35 1XX                              07/25/79                                    *
*       COUNSELOR                                    REVIEW DT LIST-ORIG COU             *
*        CLIENT'S NAME AND NUMBER          CS MS SDSI SD-SCN  UNLIQ $  REVIEW DATA      *
*                                                                                       *
*  * BBBBBBB      CATHERIN 1---------5    14 12                  .00  07/79   **        *
*    CCCCCCC      ROBERT   1---------6    29 11       09 9XX     .00  08/79             *
*    FFFFFFF      JOSEPH   1---------6    18 09       03 9XX  1968.00  08/79             *
*    MMMMMMM      VINCE    0---------9    20 01                96.00  07/79   **        *
*    PPPPPPP      BETTY    1---------8    18 11  1 1            .00  08/79             *
*    PPPPPPP      CARL     0---------9    39 34       05 0XX     .00  09/79             *
*  * SSSSSSS      ANTHONY  1---------5    17 07                 .00  07/79   **        *
*  D SSSSSSS      THOMAS   2---------4    16 00              531.60  05/79             *
*  D SSSSSSS      FREDERIC 2---------6    39 10       09 9XX     .00  06/79   00        *
*                                                                                       *
*****************************************************************************************
```

ANNUAL CASELOAD REVIEW

ENTRY CODE VR 35 XXX

THE CODE 35-ANNUAL CASELOAD REVIEW IS AVAILABLE TO ASSIST REHABILITATION STAFF IN ACCOMPLISHING THE FEDERALLY MANDATED ANNUAL COMPREHENSIVE REVIEW AS EXPLAINED IN THE IWRP SYSTEM.

CODE 35 WILL PRODUCE A LISTING OF ONLY THOSE CASES THAT ARE TO BE REVIEWED WITHIN A 3 MONTH PERIOD OR ARE PAST DUE FOR A COMPREHENSIVE REVIEW. CASES THAT ARE DUE WITHIN THE CURRENT MONTH WILL BE INDICATED BY ASTERISKS (*). ONE * WILL BE LOCATED TO THE LEFT OF CLIENTS LAST NAME, 2 ** WILL BE LOCATED UNDER THE 'DATA' COLUMN. IF CASE IS PAST DUE --D'S-- WILL BE LOCATED IN THE SAME POSITIONS AS THE ASTERISKS (NOTE EXAMPLE ABOVE).

THIS REPORT CAN ALSO BE OBTAINED FOR A SUPERVISORY COUNSELOR BY ADDING AN 'S' TO THE ENTRY CODE (VR 35 XXXS).

REMINDER... PLEASE REFER TO THE GLOSSARY IF IN QUESTION ON COLUMNAR HEADERS.

```
**********************************************************************************
* VR 36 C1XX                                                                     *
*                                    06/19/79                                    *
*              UNLIQUIDATED ENCUMBRANCES FOR COUNSELOR NO. 1XX                   *
*      CLIENT                        SUPPLIER                SUPV   AUTH   EFF   *
* NUMBER     LAST NAME     SSEI NUMB    NAME                DN-COUN  NO.   DATE  BALANCE *
* 2--------4 SSSSSSS   T  20000000003 SKILLS INC                48--97 050779  400.00 *
**1--------6 FFFFFFF   J  20000000009 COLLEGE          01 9XX 23--54 100178  987.55 *
* 0--------9 MMMMMMM   V  20000000006 INST OF ART      01 7XX 23--81 100178  660.59 *
* 1--------5 WWWWWWW   D  20000000006 INST OF ART      01 7XX 24--91 100178 1419.00 *
* 1--------9 MMMMMMM   D  20000000004 FISSSSS MMM              54--73 050779   35.00 *
* 1--------1 SSSSSSS   R  20000000004 FISSSSS MMM              48--47 032879   35.00 *
* 1--------6 FFFFFFF   J  20000000007 SCHOOL           01 9XX 23--55 100178 1709.00 *
* 2--------6 KKKKKKK   A  20000000009 BREESMEN WM T           48--06 042779   55.00 *
*                                                                      P-REG=    *
**********************************************************************************
```

UNLIQUIDATED ENCUMBRANCES BY COUNSELOR
ENTRY CODE VR 36 CXXX

VR 36 C-UNLIQUIDATED ENCUMBRANCES BY COUNSELOR WAS IMPLEMENTED INTO THE COMPUTER SYSTEM TO ASSIST STAFF IN PURGING OUTSTANDING ENCUMBRANCES WITHIN THEIR CASELOAD. THIS CODE IS CURRENTLY UNIQUE AS IT WILL INDICATE THE VENDOR NAME ALONG SIDE OF THE VENDOR NUMBER (SSEI NUMB) MAKING IT MUCH EASIER TO DIRECTLY LOCATE BOTH TO WHOM ENCUMBRANCES HAVE BEEN ISSUED AND THE CURRENT BALANCE REMAINING ON A SPECIFIC AUTHORIZATION.

THE COLUMNAR HEADINGS USED IN THIS CODE ARE SELF-EXPLANATORY. IF YOU REFER TO THE ABOVE EXAMPLE WE WILL GET INTO AN EXPLANATION CONCERNING THE DATA IN CODE 36 C-UNLIQUIDATED ENCUMBRANCES BY COUNSELOR.

FROM LEFT TO RIGHT
- CLIENT'S NUMBER AND NAME
- VENDOR NUMBER AND NAME
- IF IN SUPERVISION, SUPERVISING DISTRICT AND COUNSELOR
- AUTHORIZATION NUMBER
- EFFECTIVE DATE OF AUTHORIZATION
- BALANCE

THREE POINTS TO REMEMBER WHEN UTILIZING THIS CODE...

1) AS THE FISCAL INFORMATION IS GROUPED BY VENDOR, SCAN PRINT-OUT FOR ADDITIONAL ENCUMBRANCES ON A CLIENT IF NECESSARY. CLIENTS MAY HAVE NUMEROUS AUTHORIZATIONS ISSUED TO VARIOUS VENDORS. SUCH IS THE CASE IN THIS EXAMPLE REGARDING CLIENT NUMBER 1--------0, FFFFF, WHICH IS INDICATED BY DOUBLE ASTERISKS IN THE LEFT HAND COLUMN.
2) KEEP IN MIND THE LAPSE OF TIME INVOLVED IN PROCESSING FISCAL DOCUMENTS. FISCAL INFORMATION IS UPDATED BASED UPON THE FREQUENCY OF VOUCHERS RECEIVED IN EDP FROM THE FISCAL SECTION OF THE BUREAU.
3) THE FINAL PAGE OF THE PRINT-OUT WILL GIVE THE TOTAL NUMBER OF AUTHORIZATIONS AND TOTAL BALANCE OF UNLIQUIDATED MONIES FOR THE COUNSELOR.

THIS PRINT-OUT CAN ALSO BE OBTAINED FOR A SUPERVISORY COUNSELOR BY USING THE ENTRY CODE OF VR 36 CXXXS.

```
**********************************************************************************
*   PR DISTRICT  01  COUNSELOR 1XX  W   FFFFFFF          CASELOAD AS OF 02/15/78  *
* CLIENT'S NAME AND NUMBER  T-DT  SDSI CS MS UNLIQ  $  FISC YR$ FAC $ TF $ SSI $  *
* FFFFFFF   JOSE  1-------6 039XX      18 05 $3471.52  $1955.58   $0   $0    $0  *
* FFFFFFF   MART  2-------9            39 06     $.00  $1035.00   $0   $0    $0  *
* FFFFFFF   TERE  1-------5            18 06 $2711.50  $1474.70   $0   $0    $0* *
* FFFFFFF   EDWA  1-------6 01/79      16 12 $2900.40  $2100.00   $0   $0    $0  *
* FFFFFFF   JERR  1-------8            16 02     $.00    $48.00   $0   $0    $0  *
*                                                                                *
* ----------1---------- --2-- -3-- -4 -5 ----6---  --- 7--- --8--  -9-  -10 11*  *
*                                                                                *
**********************************************************************************
```

REGULAR FISCAL PRINT-OUT

AUTOMATIC PRINT ENTRY CODE VR 37 XXXF
DISPLAY ONLY ENTRY CODE VR 39 XXXF

THE ENTRY CODES OF VR 37 XXX AND VR 39 XXX WHEN FOLLOWED BY AN 'F' WILL PRODUCE AN ALPHABETIC LISTING OF ACTIVE CLIENTS' EXPENDITURE FIGURES. THESE EXPENDITURES ON EACH CLIENT HAVE BEEN BROKEN DOWN TO SHOW TOTAL UNLIQUIDATED MONIES, CURRENT FISCAL YEAR MONIES, AND BROKEN DOWN FURTHER BY FACILITY, TRUST FUND AND SSI COSTS INCURRED ON ACTIVE CLIENTS THROUGHOUT THEIR ENTIRE REHABILITATION PROCESS. IF A COUNSELOR IS CONCERNED WITH ONLY THOSE CLIENTS WITH UNLIQUIDATED ENCUMBRANCES REMAINING --ADD A 'U' TO THE ENTRY CODE AS FOLLOWS....

AUTOMATIC PRINT ENTRY CODE	VR 37 XXXFU ---	REGULAR FISCAL PRINT-OUT
DISPLAY ONLY ENTRY CODE	VR 39 XXXFU ---	UNLIQ. ENCUMBRANCES ONLY

COLUMNAR EXPLANATIONS ON THE ABOVE 4 CODES WILL BE GIVEN BY RELATING CORRESPONDING NUMBERS...

1. CLIENT'S LAST NAME, FIRST NAME AND CLIENT NUMBER

2. TRANSFER DATE. IF CASE WAS IN SUPERVISION AND RETURNED THE 4 DIGITS WITH A '/' INDICATE DATE RECORDED CASE WAS RETURNED FROM SUPERVISION. IF THERE ARE 5 DIGITS WITH NO '/' THIS INDICATES CASE IS CURRENTLY IN SUPERVISION.

3. SSDI/SSI CONTROL CODES
   UNDER THE D POSITION - SSDI CONTROL CODES OF 1 OR 9
   UNDER THE I POSITION - SSI CONTROL CODES OF 1 OR 9

4. CURRENT STATUS

5. MONTHS IN CURRENT STATUS

6. UNLIQUIDATED ENCUMBRANCES

7. CURRENT FISCAL YEAR EXPENDITURES

8. FACILITY COSTS

9. TRUST FUND COSTS

10. SSI COSTS

11. IF CASE HAS BEEN CODED SEVERELY DISABLED, AN ASTERISK WILL APPEAR IN THIS POSITION.

```
*****************************************************************************
*  VR 28                          08/24/79                                  *
*                       SUPPLIER MASTER DISPLAY                             *
*                                                                           *
*  ---------------------------1                                            *
* NUMBER  70000000000 ------------                                          *
* NAME    ELECTRO      INS       -                                          *
* ADDRESS HILL STREET            ---2                                       *
* CITY    XXXXXXXXXXX            -                                          *
* STATE   PA  ZIP 1XXXX ----------        UPDATE INFORMATION                *
* SERVICE CODE 03-----------------3    5-- REQ-DISTRICT 01                  *
*                                      6-- CHG-DISTRICT                     *
*                                      7-- VERIFIED RCD                     *
*  TAX INFORMATION --------            8-- DATE OF ADD OR LAST CHANGE  03/79 *
* SUPPLIER TYPE          2 -                                                *
* CORPORATE INDICATOR    N -                                                *
* 1099 TYPE              1 ---4  ------------------------------------------ *
* LEAD RECORD INDICATOR  1 -     -              MONEY FIELDS                 *
* 1099 INDICATOR         2 -     -   CURRENT YEAR  1 YEAR PRIOR  2 YEAR PRIOR*
* 1099 NUMBER     000000000-     -BVR    4,484.50     19,315.92     22,588.45*
* ------------------------      -DDD        .00          .00           .00 *
*                               -IRS        .00     19,315.92     20,003.43 *
*                               ------------------- 9 ------------------     *
*****************************************************************************
```

SUPPLIER MASTER DISPLAY
ENTRY CODE VR 28 XXXXXXXXXX

THE SUPPLIER MASTER DISPLAY IS A REPORT CONTAINING ALL VENDOR INFORMATION THAT IS AVAILABLE FROM CENTRAL OFFICE ON ONE PARTICULAR VENDOR.

THIS CODE IS PRIMARILY USED BY THE DISTRICT OFFICE FISCAL SECTIONS AND CENTRAL OFFICE FOR IRS REPORTING PURPOSES.

PLEASE ASSOCIATE CORRESPONDING NUMBERS FOR A COMPLETE EXPLANATION OF THIS CODE.

1. THIS POSITION WILL BE BLANK IF ALL DATA IS VALID. IF THE VENDOR NUMBER IS AN INCORRECT TAX NUMBER, INCORRECT ADDRESS, VENDOR IS DECEASED OR NO LONGER WISHES TO BE USED --THE MESSAGE 'INVALID- CALL EDP' WILL BE DISPLAYED.
2. VENDOR NUMBER, NAME AND ADDRESS
3. SERVICE CODE - BASIC SERVICE PROVIDED BY THE VENDOR
4. THIS SECTION TITLED 'TAX INFORMATION' IS FOR USE BY CENTRAL OFFICE FOR TAX REPORTING PURPOSES.
5. REG-DISTRICT - THIS WILL BE THE OFFICE NUMBER WHO REQUESTED VENDOR BE ADDED TO THE VENDOR FILE.
6. CHG-DISTRICT - THE OFFICE NUMBER THAT LAST REQUESTED A CHANGE TO A PARTICULAR VENDOR.
7. VERIFIED RECORD - IF A 'U' APPEARS IN THIS POSITION THIS INDICATES VENDOR INFORMATION HAS BEEN VERIFIED.
8. DATE VENDOR WAS ADDED TO THE FILE OR THE LAST DATE A CHANGE WAS MADE SUCH AS ADDRESS OR NAME.
9. MONEY FIELDS - THIS SECTION PROVIDES A BREAKDOWN OF MONEY AMOUNTS PAID TO A PARTICULAR VENDOR FOR THE CURRENT FISCAL YEAR, 1 YEAR PRIOR AND 2 YEARS PRIOR.
   THE BVR AND DDD AMOUNTS ARE BASED ON THE FISCAL YEAR RUNNING FROM OCT 1 THRU SEPT 30.
   THE IRS AMOUNTS RUN ON A CALENDAR YEAR STARTING JAN. 1 AND RUNNING TO DEC. 31.

```
**********************************************************************************
*  VR 29 ELECT                        11/02/79                            PAGE   *
* SUPPLIER NAME          STREET ADDRESS        CITY        ST  ZIP     SSEI   NP *
* ELECTRIC XXXXXXXXXXX   XXXXFRANKLING AVE     AAAAAAAAA   PA  1XXXX 10000000007  *
* ELECTRONIXXXXXXXXXXXX  XXXXXXXXXXX          BBBBBBBBB   PA  1XXXX 20000000000  *
* ELECTRONICXXXXXXXXXX   XXXXXXXXXX HILL RD   PPPPPPPPP   PA  1XXXX 20000000001  *
* ELECTRONICSXXXXXXXXX   XXXXXXXXXXRON ST     HHHHHHHHH   PA  1XXXX 70000000000  *
*                                                                                *
**********************************************************************************
```

SUPPLIER INQUIRY – NAME

ENTRY CODE VR 29 VENDOR NAME

CODE 29 IS ONE OF THE CODES AVAILABLE TO OBTAIN VENDOR INFORMATION. THE SIZE AND TIME INVOLVED IN PRINTING NEW VENDOR BOOKS MAKES IT IMPRACTICAL TO SEN D A NEW VENDOR LISTING TO EACH OFFICE ON A MONTHLY BASIS. THE USE OF CODE VR 29 GIVES DISTRICT OFFICES ACCESS TO THE MOST CURRENT VENDOR FILE THAT THE BUREAU POSSESSES. USE OF THIS CODE CAN ELIMINATE UNNECESSARY CALLS TO THE CENTRAL OFFICE IN SEEKING NEWLY ADDED OR REVISED VENDOR INFORMATION.

OFTEN TIMES A NEED FOR INFORMATION ON A NEW VENDOR OR UNCOMMON VENDOR IN YOUR DISTRICT MAY OCCUR. ALL YOU KNOW IS THE NAME, MAYBE ONLY THE LAST NAME. BY USING THIS CODE THAT IS ALL THAT IS NECESSARY. IN THE ABOVE EXAMPLE ALL THAT WAS NECESSARY AS PRIOR KNOWLEDGE WAS 'ELECT'. VR 29 ELECT WAS THEN ENTERED INTO THE TERMINAL WHICH BROUGHT UP EVERY VENDOR NAME AVAILABLE WITHIN BVP STARTING WITH THE LETTERS 'ELECT'. AFTER LOCATING THE PARTICULAR VENDOR NAME YOU DESIRE YOU IMMEDIATELY HAVE THE PROPER SPELLING AND/OR ABBREVIATIONS, ADDRESS AND VENDOR NUMBER.

TO OBTAIN ANY DESIRED VENDOR A MINIMUM OF 3 DIGITS IS NECESSARY TO OBTAIN THE INFORMATION FROM THE TERMINAL. THE COMPUTER WILL PRODUCE VENDORS EXACTLY AS THEY ARE TYPED, INCLUDING BLANK SPACES.

> NOTE.. IF YOU WERE TO ENTER WHAT YOU THOUGHT TO BE THE CORRECT SPELLING OF A VENDOR NAME CONSISTING OF 15 DIGITS AND A 'NO RECORD ON FILE' MESSAGE IS DISPLAYED, REDUCE THE NUMBER OF DIGITS ENTERED DOWN TO A MINIMUM OF 3 DIGITS THAT YOU ARE FAIRLY CERTAIN ARE CORRECT.

THE COLUMNAR HEADINGS IN THIS PARTICULAR CODE ARE VERY MUCH SELF-EXPLANATORY AND EASY TO UNDERSTAND. NP IS FOR CENTRAL OFFICE USE.

```
*****************************************************************************
*  VR 36 V70000000000                  09/15/79                             *
*                                                                           *
*          1---UNLIQUIDATED ENCUMBRANCES FOR CURRENT FISCAL YEAR            *
*       SUPPLIER NUMBER    70000000000  -  SUPPLIER NAME ELECTROXXXXXXXXXX   *
*   CLIENT          CLIENT NAME          ORIG SUPV AUTH    EFF    LST-INV    *
*   NUMBER      LAST        FIRST    DN-COUN DN   NO.     DATE    DATE      BALANCE *
* 1-------3 KKKKKKK       RICHARD  J 14 4XX  01 300590  102478  011079  $ 1,600.00 *
* 1-------1 EEEEEEE       WAYNE    J 01 3XX  01 540028  030179          $   800.00 *
* 1-------6 RRRRRRR       RICHARD  A 01 9XX  01 300558  100278  051079  $ 1,403.80 *
* 1-------9 EEEEEEEE      DAVID    L 01 3XX  01 300879  112979  051079  $   288.00 *
* 1-------6 VVVVVVV       HEDDY    A 01 6XX  01 300646  101778  051079  $ 1,268.00 *
* 2-------5 WWWWWWWWW     HOWARD   F 01 9XX  01 366001  100278  051079  $   498.20 *
* 2-------2 PPPPPPPPP     LARRY    J 14 2XX  01 330046  110678  051079  $   796.00 *
* 2-------0 MMMMMM        JEFFREY  D 14 2XX  01 300557  100278  111778  $ 1,190.45 *
* 5-------0 NNNNNNN       NHAN     C 01 9XX  01 300559  100578  051079  $ 1,511.00 *
* ---------------- 2 ------------ ---3-- -4- ---5-- --6--- ---7-- ----8---- *
*                                                                           *
***** AUTHORIZATIONS      09     ***** BALANCE      9,345.90                *
*      ---------- 9 --------             ---------- 10 ------               *
*                                                                           *
*****************************************************************************
```

UNLIQUIDATED ENCUMBRANCES BY VENDOR

ENTRY CODE VR 36 VXXXXXXXXXX

VR 36 V WILL PRODUCE A LISTING OF UNLIQUIDATED ENCUMBRANCES FOR THE CURRENT FISCAL YEAR FOR ONE SPECIFIC VENDOR AS REQUESTED IN THE ENTRY CODE.

THIS CODE WAS DEVELOPED TO ASSIST IN FISCAL RELATED MATTERS CONCERNING VENDORS. USE OF THIS CODE PROVIDES YOU WITH A COMPLETE LISTING OF ALL 'OPEN' ENCUMBRANCES FOR A PARTICULAR VENDOR.

BY REFERRING TO THE ABOVE EXAMPLE ON ELECTROXXXXXXXXX AND COMPARING CORRESPONDING NUMBERS FOR AN EXPLANATION YOU WILL SEE HOW THIS CODE CAN BE OF ASSISTANCE WHEN PURGES ARE REQUIRED NEAR THE END OF A FISCAL YEAR.

1. SUPPLIER NUMBER AND SUPPLIER NAME
2. CLIENT NUMBER AND CLIENT NAME
3. UNDER 'DN' POSITIONS - ORIGINATING DISTRICT NUMBER
   UNDER 'COU' POSITIONS - ORIGINATING COUNSELOR NUMBER
4. SUPERVISING DISTRICT OFFICE NUMBER IF IN SUPERVISION.
5. AUTHORIZATION NUMBER
6. EFFECTIVE DATE OF INITIAL 201 AUTHORIZATION
7. LAST INVOICE DATE
   THIS DATE IS TAKEN FROM THE UPPER RIGHTHAND CORNER OF AN INVOICE RECEIVED FROM A VENDOR.
8. BALANCE OF AUTHORIZATION NUMBER LISTED IN COLUMN 5.
9. TOTAL NUMBER OF AUTHORIZATIONS WITH AN OPEN ENCUMBRANCE.
10. TOTAL BALANCE OF AUTHORIZATIONS OPEN.

CODE VR 36 V CAN BE BROKEN DOWN FURTHER TO SELECT AUTHORIZATIONS WITHIN A SPECIFIC TIME PERIOD. THE ENTRY CODE WOULD CHANGE AND BE SUBMITTED AS FOLLOWS....

VR 36 DXXXXXXXXXXXMMMM (MM INDICATING 2 DIGIT MONTH)

USING THE ABOVE ENTRY CODE YOU CAN DESIGNATE A SPECIFIC TIME PERIOD 'FROM-THROUGH' THAT WOULD DISPLAY ONLY THOSE OPEN AUTHORIZATIONS WRITTEN BETWEEN THE DESIGNATED TIME REQUESTED. THE DATE TO BE USED WOULD BE THE 'EFFECTIVE DATE' OF THE AUTHORIZATION NOT THE 'INVOICE DATE'.

```
*****************************************************************************************
*   VR 40 1XX/12                          07/26/79                          PAGE 1      *
*      COUNSELOR  1XX   W FFFFFF                STATUS LIST-OPEN CASES                  *
*  CLIENT'S NAME AND NUMBER  R-DT B-DT DIS RS UNLIQ $  VO FD SOSI TR-DT REVW CS MS      *
* CCCCCC      PATR 0-------1 1078 1031 140 79   420.00 59 1        03/79 01/0 12 06    *
* CCCCCC      RUTH 2-------8 0579 1052 149 40    12.50 30 1          /   07/0 12 00    *
* KKKKKK      LEAH 2-------8 0579 0954 660 79    21.00 31 1          /   07/0 12 00    *
* MMMMMM      RAYM 1-------6 0378 0559 379 79     .00 09 1        01310 06/0 12 01    *
* TTTTTT      VIRG 2-------3 0379 0857 614 79     .00 21 1        01963 07/0 12 01    *
* VVVVVV      ESTH 1------0 0479 0819 149 40      .00 59 1              07/0 12 00    *
*                                                                                       *
*****************************************************************************************
```

REGULAR ALPHABETIC PRINT-OUT IN SELECTED STATUS

ENTRY CODE: VR 40 XXX/STATUS
VR 40 XXX/STATUS/MONTHS

ANOTHER VARIATION TO THE REGULAR ALPHABETIC COUNSELOR PRINT-OUT CAN BE OBTAINED BY USING THE ENTRY CODE OF VR 40 XXX/STATUS. **USE OF THIS ENTRY CODE ENABLES YOU TO SPECIFY ONE PARTICULAR STATUS OFF OF THE REGULAR ALPHABETIC PRINT-OUT.**

AS IN THE ABOVE EXAMPLE COUNSELOR 104 WAS CONCERNED ONLY WITH CASES IN STATUS 12.
VR 40 104/12
WAS THEN ENTERED INTO THE MACHINE TO PRODUCE THE ABOVE LIST.

BY CHANGING THE ENTRY CODE TO VR 40 XXXS/STATUS, SUPERVISORY COUNSELORS ALSO HAVE THE OPTION TO SPECIFY ONE SPECIFIC STATUS.

THIS CODE CAN BE BROKEN DOWN FURTHER IF DESIRED TO DESIGNATE A SPECIFIC NUMBER OF MONTHS.

EXAMPLE.... COUNSELOR 1XX WAS ONLY INTERESTED IN CASES IN STATUS 12 FOR 3 MONTHS OR MORE. VR 40 1XX/12/03 WAS THEN ENTERED INTO THE MACHINE TO PRODUCE A FURTHER BREAKDOWN OF STATUS 12 CASES AS SHOWN BELOW

```
*****************************************************************************************
*   VR 40 1XX/12/03                       07/26/79                          PAGE 1      *
*      COUNSELOR  1XX   W FFFFFF                STATUS LIST-OPEN CASES                  *
*  CLIENT'S NAME AND NUMBER  R-DT B-DT DIS RS UNLIQ $  VO FD SOSI TR-DT REVW CS MS      *
* CCCCCC      PATR 0-------1 1078 1031 140 79   420.00 59 1        03/79 01/0 12 06    *
*****************************************************************************************
```

PLEASE KEEP IN MIND WHEN DESIGNATING MONTHS TO **ENTER THE --EXACT-- NUMBER OF MONTHS DESIRED** AS THIS WILL PRODUCE A LISTING OF THE SPECIFIED NUMBER OF MONTHS AND HIGHER.

SUPERVISORY COUNSELORS IF INTERESTED IN A SPECIFIC STATUS FOR A PARTICULAR NUMBER OF MONTHS WOULD USE THE ENTRY CODE OF
VR 40 XXXS/STATUS/MONTHS

REMINDER.... REFER BACK TO EXPLANATION GIVEN FOR THE 'REGULAR ALPHABETIC P-O' IF THERE IS A QUESTION ON THE DATA CONTAINED IN THESE ENTRY CODES.

```
*     PAGE 1                                                    04/25/78        *
*                    BVR CLOSED CASE REPORT FOR COUNSELOR 1XX                   *
* CLIENT'S NAME AND NUMBER   RA AC 10 12 DIS RS JO OCC WS PA PS FAC CS CF PC COST *
*  AAAAAAAA      J 1-------3  7  0       666 59          8  5  04      08 02  3   10 *
*  BBBBBBBB      S 0-------8  8  0       220 79          8  5  04      08 02  2  110 *
*  BBBBBBBB      R 1-------5  1 19 00    660 79 20  59 5* 00 01 000 28 16  3  657 *
*  BBBBBBBB      D 1-------2  1  0       39- 50                       08 00  3    0 *
*  BBBBBBBB      S 1-------6  2  6 00    660 38 31  -- 88 00 01 000 28 16  7  584 *
*  BBBBBBBB      M 1-------8  4  0       666 79          9  0  01      08 02  9   75 *
*                                                                                *
* ----------1---------- -2 -3 -4 -5 -6- -7 -8 -9- 10 11 12 -13 14 15 16  -17- *
*                                                                                *
```

ALPHABETIC CLOSED STATISTICAL
ANALYSIS PRINT-OUT

AUTOMATIC PRINT ENTRY CODE VR 37 XXXCST
DISPLAY ONLY ENTRY CODE VR 39 XXXCST

CODES VR 37 XXXCST AND VR 39 XXXCST WILL PRODUCE THE ALPHABETIC CLOSED STATISTICAL ANALYSIS PRINT-OUT BY COUNSELOR.

THIS PRINT-OUT IS TO BE USED TO ASSIST REHABILITATION STAFF WHEN A COMPLETE STATISTICAL REVIEW OF A COUNSELORS' CLOSED CASES FOR THE CURRENT FISCAL YEAR IS BEING CONDUCTED.

BY ASSOCIATING CORRESPONDING NUMBERS YOU WILL SEE SOME OF THE INFORMATION THAT CAN BE OBTAINED ON CLOSED CASES WITH THIS PARTICULAR REPORT.

2. NUMBER OF MONTHS FROM REFERRAL TO ACCEPTANCE
3. MONTHS FROM ACCEPTANCE TO CLOSURE
4. MONTHS IN STATUS 10
5. MONTHS IN STATUS 12
6. DISABILITY AS REPORTED ON 08 CLOSURES AND MAJOR DISABLING CONDITION ON OTHER CLOSURES
7. REFERRAL SOURCE
8. FIRST TWO DIGITS OF THE LAST JOB OBJECTIVE
9. FIRST TWO DIGITS OF THE OCCUPATIONAL CODE AT CLOSURE
10. WORK STATUS
    UNDER THE 'W' POSITION - WORK STATUS AT REFERRAL
    UNDER THE 'S' POSITION - WORK STATUS AT CLOSURE
11. PUBLIC ASSISTANCE INFORMATION
    UNDER THE 'P' POSITION - P. A. AT REFERRAL
    UNDER THE 'A' POSITION - P. A. AT CLOSURE
12. PRIMARY SOURCE OF SUPPORT
13. WEEKLY EARNINGS AT CLOSURE
14. CLOSURE STATUS
15. CLOSED FROM STATUS
16. REASON FOR CLOSURE
    NOTE... ONLY THOSE CASES CLOSED NON-REHABILITATED WILL HAVE A REASON FOR CLOSURE INDICATED.
17. ALL SERVICE COST TOTAL
    THIS TOTAL WILL BE **ALL** SERVICE COSTS ON CLIENT INCLUDING ANY THIRD PARTY INVOLVEMENT.

YOU WILL NOTE THE CLOSURE DATE IS NOT INCLUDED ON THIS REPORT. IF IT IS NECESSARY TO OBTAIN A COMPLETE LISTING WITH THE DATE OF CLOSURE LISTED YOU WILL USE ONE OF THE FOLLOWING ENTRIES.....

AUTOMATIC PRINT ENTRY FOR - ENTIRE REGULAR ALPHABETIC PRINT-OUT--
VR 37 XXXCR

DISPLAY ONLY ENTRY FOR - ENTIRE REGULAR ALPHABETIC PRINT-OUT--
VR 39 XXXCR

COUNSELOR STATISTICAL TOTAL PAGE

```
*****************************************************************************************
*  VR 23 9XX                          10/31/79                                PAGE 01   *
* ***COUNSELOR TOTAL PAGE****  DISCOND COUNT     DIST 03 COUN A AAAAAAA                 *
*STAT COUNT FY EXPD UNLIQ ENC  100-149   26  ***CLIENTS OUT FOR SUPERVISION***          *
* 00     0 $      .00 $       .00 200-229   38     IN DD  COUNT     IN DD  COUNT -     *
* 02    11 $   561.00 $       .00 300-399   74       01      0       09      0  -     *
* 06     0 $      .00 $       .00 400-499    5       02      1       10      6  -     *
* 10     1 $      .00 $       .00    500     0       03     66       11      0  -     *
* 12     0 $      .00 $       .00    510     2       04      0       12      8  --(9)*
* 14    32 $ 7054.62 $       .00    520     0       05      7       14      2  -     *
* 16     2 $    80.00 $       .00    521     0       06      0       15      0  -     *
* 17    60 $11815.60 $       .00    522     6       07      1       16      2  -     *
* 18    28 $19238.92 $    438.06 530-534     1       08     11       99      1  -     *
* 19     0 $      .00 $       .00 600-609     7  ------------------TOTAL---105---(10)*
* 20     7 $ 2965.00 $       .00 610-619    56  ***TOTAL UNLIQUIDATED ENCUMBRANCES--   *
* 22     6 $ 1726.89 $       .00 620-629 (11)---1. FOR CASES LISTED ABOVE              *
* 24    13 $ 3859.26 $       .00 630-639    33  -       A. WITHIN DD        $ 4489.05  *
* 29    12 $ 6232.73 $       .00 640-649    10  -       B. BY OTHER DD      $ 2113.71  *
* 39   115 $84898.08 $   6163.71 650-659     2  -2. FOR UNSUPERVISED CASES $      .00  *
* 08     1 $   234.00 $    150.00 660-669     5  ***ACTIVE CASES W/ REF SOURCE OF 50    *
* 26     6 $ 7038.13 $       .00 670-671     1  - AND A. SSDI OR SSI AT REF OF 1       *
* 28     0 $      .00 $       .00 680-689     7  -         COUNT     0  PERCENT   .0  -  *
* 30     0 $      .00 $       .00 690-699     1  -      B. SSDI & SSI AT REF NOT 1    -  *
*---(1)-- ---(2)--- ----(3)--- --(4)--         -         COUNT     0  PERCENT   .0  -  *
*T-   294$145704.23 $  6601.77 TOTAL-    276 -------------(12)-------------------     *
*---(5)-- ---(6)--- ---(7)---- -----(8)-----                          P-REQ=             *
*                                                                                       *
*****************************************************************************************
*  VR 23 9XX                          10/31/79                                PAGE 02   *
* ***COUNSELOR TOTAL PAGE****                 DIST 03  COUN A AAAAAAA                   *
*  *****SEVERELY DISABLED CASES*********  *****CLOSED REHABILITATED DATA*****           *
*                          COUNT PERCENT(2)*WORK STATUS AT CLOSURE INDICATING          *
*   A. ACTIVE CASES (06-39)   56   20.3     - A. COMPETITIVE EMPLOYMENT            5    *
*   B. REHABS (26 CLOSURES)    3   50.0     - B. HOMEMAKER                         1    *
*   C. ALL CLOSED CASES            42.9     - C. SHELTERED WORKSHOP                0    *
*   ----------------(1)----------------(3)-**WEEKLY EARNINGS AT CLOSURE*****           *
*                                          - A. HIGHER AT CLOSURE THAN            2    *
*                                          -    AT REFERRAL                       3    *
*                                          - B. ZERO AT REFERRAL, NOW GREATER          *
*                                          - C. AVERAGE FOR ALL REHABS                 *
*                                          -    WITH EARNINGS                   173    *
*                                       (4)***PUBLIC ASSISTANCE INFORMATION**          *
*                                          - A. RECEIVING AT REFERRAL             1    *
*                                          - B. RECEIVING AT CLOSURE              0    *
*                                          - C. RECEIVING ONLY BETWEEN                 *
*                                          -    REFERRAL AND CLOSURE              0    *
*                                          - D. RECEIVING LESS $ AT CLOSURE            *
*                                          -    THAN AT REFERRAL                  1    *
*                                          - E. P.A. CASES REHABILITATED          1    *
*                                          - F. SSDI CASES- NO SGA      SGA       0    *
*                                          - G. SSI CASES - NO SGA      SGA       0    *
*****************************************************************************************
```

COUNSELOR STATISTICAL TOTAL PAGE

ENTRY CODE VR 23 XXX

THE COUNSELOR STATISTICAL TOTAL PAGE IS A 2 PAGE REPORT COMPILED FROM RELEVANT STATISTICAL DATA OBTAINED FROM A COUNSELOR'S ASSIGNED CASELOAD. THIS CODE IF UNDERSTOOD PROPERLY CAN BE OF VALUABLE ASSISTANCE IN ANALYZING A PARTICULAR COUNSELOR'S CASELOAD ACTIVITIES.

Appendix B

Occupational Information Systems

Vendor System	Developer/Representative
AEL (Appalachia Educational Laboratory)	McKnight Publishing Company Bloomington, Illinois * print system only
CHOICES – 1976 (Computerized Heuristic Occupational Information and Career Exploration System)	Phillip S. Jarvis, Senior Consultant Canada Systems Group 90 Sparks Street, Suite 704 Ottawa, Ontario K1P 5B4 613/563-4444 Thomas M. Moore, Managing Partner DMR & Associates 112 Kent Street, Suite 2218 Ottawa, Ontario K1P 5P2 613/238-2697
CIS – 1969 (Career Information System)	Dr. Bruce McKinlay Oregon CIS 247 Hendricks Hall University of Oregon Eugene, Oregon 97403 503/686-3111
COIN – 1978 (Coordinated Occupational Information Network)	Dr. Rodney Durgin COIN, Inc. 1230 West Wooster Bowling Green, Ohio 43402 419/352-8431
CVIS – 1967 (Computerized Vocational Information System)	Carol M. Rabush CVIS Distribution Center Western Maryland College Westminster, Maryland 21157 301/848-1113

Vendor System	Developer/Representative
DISCOVER – 1976	Dr. JoAnn Harris-Bowlsbey DISCOVER Foundation, Inc. P.O. Box 363 Westminster, Maryland 21157 301/848-1113 IBM Corporation 1133 Westchester Avenue White Plains, New York 10604
ECES – 1966 (Educational and Career Exploration System)	Dr. Alva E. Mallory, Jr. Genesee Intermediate School District 2413 West Maple Avenue Flint, Michigan 48507 313/767-4310
EXPLORE – 1980	Dr. JoAnn Harris-Bowlsbey Mr. Charles Maloy Towson State University Counseling Center Towson, Maryland 21204 301/321-2512
GIS III – 1971 (Guidance Information System)	Linda Kobylarz Time Share Corporation 630 Oakwood Avenue West Hartford, Connecticut 06110 203/522-0136
SCAD – 1979 (Student Career Assessment and Determination)	Lawrence G. Lloyd, Senior Consultant Evaluation Techniques Consortium 9950 Topanga Canyon Boulevard Chatsworth, California 91311 213/882-6622
SEARCH – 1970 (System Exploration and Research for Career Help)	State of Oregon Employment Division Department of Human Resources 875 Union Street, N.E. Salem, Oregon 97311 503/378-8289
SIGI – 1972 (System of Interactive Guidance and Information)	Dr. Martin R. Katz Educational Testing Service Princeton, New Jersey 08541 609/921-9000

Vendor System	Developer/Representative
VIEW – 1970 (Vital Information for Education and Work)	Center for Career Development Services Florida Department of Education Division of Vocational Education Tallahassee, Florida 32301 904/488-0400 800/342-9271 * microfiche system only
VIP – 1976 (Vocational Information Program)	John Cripe, VIP Coordinator Data Processing Department Joliet Junior College 1216 Humboldt Avenue Joliet, Illinois 60436 815/729-9020
VOCOMP – 1978	Gary and Marjorie Golter Innovative Software 19824 Ventura Boulevard #102 Woodland Hills, California 91364 213/884-5581

```
**********  VERSION 04.01   DATE 08/21/80   TIME 10:26:45   STATION SQT003 **********

                WELCOME TO THE NORTH CAROLINA CAREER INFORMATION DELIVERY SYSTEM
                ***************************************************************

PLEASE TYPE IN YOUR FIRST NAME, THEN PRESS THE 'RETURN' KEY ON THE RIGHT HAND SIDE OF THE KEYBOARD.  (IN FACT, WHENEVER
YOU HAVE FINISHED ANSWERING ANY QUESTION, YOU'LL HAVE TO PRESS THE 'RETURN' KEY SO I'LL KNOW YOU'VE FINISHED.)

CAREERPLANNER

CAREERPLANNER, DO I HAVE YOUR NAME RIGHT?  (Y OR N).

Y

THERE ARE TWO MAJOR SYSTEMS IN MY MEMORY CAREERPLANNER.  NORTH CAROLINA CHOICES CONTAINS INFORMATION ABOUT
OCCUPATIONS.  THE EDUCATION SYSTEM CONTAINS INFORMATION ABOUT SCHOOLS AND PROGRAMS OF STUDY.  IF YOU ARE NOT SURE OF
THE BEST OCCUPATION FOR YOU, I SUGGEST YOU START WITH OCCUPATIONS.

WHAT WOULD YOU LIKE TO DO FIRST?  (PLEASE TYPE IN 1 OR 2).
 1. CONSIDER OCCUPATIONS.
 2. CONSIDER SCHOOLS AND PROGRAMS OF STUDY.

1

HAVE I SPOKEN TO YOU ABOUT OCCUPATIONS BEFORE?  (Y OR N).

N

HELLO CAREERPLANNER. IT'S A PLEASURE TO WORK WITH YOU. I'M NORTH CAROLINA CHOICES.  I WAS CREATED BY THE CANADIAN
GOVERNMENT AND ADAPTED BY NORTH CAROLINA TO ASSIST PEOPLE IN MAKING CAREER DECISIONS. I'LL TRY MY BEST TO PROVIDE
INFORMATION WHICH HELPS YOU CAREERPLANNER. BUT PLEASE DON'T EXPECT ME TO DO THE WHOLE JOB!  YOU'LL STILL HAVE TO MAKE
YOUR OWN DECISIONS. YOU CAN BASE THEM PARTLY ON WHAT I'M ABLE TO TELL YOU, AND ALSO ON THE ADVICE OF YOUR COUNSELOR,
FAMILY OR FRIENDS. YOU WILL RECEIVE A PRINTED COPY OF OUR CONVERSATION. I SUGGEST YOU USE THIS AS A STEPPING STONE TO
MORE DETAILED THINKING ABOUT YOUR CAREER POSSIBILITIES. IF YOU NEED ANY HELP AT THIS TERMINAL ASK SOMEONE WHO WORKS
HERE.

IN WHICH AREA OF THE STATE WOULD YOU LIKE TO EXAMINE OCCUPATIONS? (SELECT ONE)
 1. THE COASTAL PLAINS
 2. THE PIEDMONT
 3. THE MOUNTAINS

2

OKAY CAREERPLANNER, WE WILL BE EXAMINING OCCUPATIONS FOR THE PIEDMONT. SHOULD YOU WISH TO USE ANOTHER AREA OF
THE STATE YOU MAY DO SO AT ANY TIME DURING OUR CONVERSATION BY TYPING AREA=N, WHERE N IS THE NUMBER OF ANOTHER OF THE
ONES I JUST LISTED ABOVE.

THERE ARE FOUR WAYS WE CAN APPROACH OCCUPATIONS. WHAT WOULD YOU LIKE TO DO FIRST?
```

```
 1. EXPLORE OCCUPATIONS              2. GET SPECIFIC INFORMATION ON OCCUPATIONS
 3. COMPARE UP TO 3 OCCUPATIONS      4. FIND RELATED OCCUPATIONS

?
?

OKAY CAREERPLANNER. THERE ARE QUITE A FEW DIFFERENT WAYS WE CAN SEARCH FOR OCCUPATIONS WHICH MAY BE SUITABLE FOR YOU.
IN ALL OF THEM HOWEVER, I WILL BE ASKING YOU TO ANSWER SOME QUESTIONS.  PLEASE CHOOSE YOUR ANSWERS VERY CAREFULLY. THEN
MY RESPONSES WILL BE ACCURATE FOR YOU! HERE ARE THE TOPICS AVAILABLE. PLEASE TYPE THE NUMBER(S) OF THE ONE(S) YOU WISH
TO USE (WITH A COMMA BETWEEN THEM LIKE THIS:  12,3,4,7,1)  TYPE THEM IN ORDER OF IMPORTANCE TO YOU.

  1 INTERESTS                       2 APTITUDES                       3 TEMPERAMENTS
  4 EDUCATION LEVEL                 5 ENVIRONMENTAL CONDITIONS        6 EMPLOYMENT OUTLOOK
  7 WAGE/SALARY                     8 HOURS OF WORK/TRAVEL            9 PHYSICAL DEMANDS
 10 PHYSICAL ACTIVITIES            11 INDOOR/OUTDOOR                 12 WORK FIELDS

1,3,2,7,4

YOUR INTERESTS CAN BE VERY HELPFUL IN IDENTIFYING PROMISING POSSIBILITIES, CAREERPLANNER.
PLEASE HAVE A LOOK AT THE FOLLOWING LIST OF INTERESTS:

 1. WORKING WITH THINGS, NUMBERS OR OBJECTS.
 2. DEALING WITH PEOPLE AS CLIENTS, CUSTOMERS OR ASSOCIATES IN WORKING SITUATIONS.
 3. DOING ROUTINE, DETAILED, ORGANIZED WORK.
 4. WORKING TO IMPROVE THE SOCIAL CONDITIONS OF OTHERS.
 5. DIRECTING, PLANNING OR ORGANIZING ACTIVITIES AND/OR WORK RESULTING IN THE RESPECT OF OTHERS.
 6. STUDYING AND COMMUNICATING IDEAS OR INFORMATION ABOUT THE SUBJECT OF PEOPLE OR ANIMALS.
 7. DOING WORK THAT REQUIRES A SCIENTIFIC, TECHNICAL OR ANALYTICAL APPROACH TO FACTS.
 8. DOING ABSTRACT OR CREATIVE WORK.
 9. WORKING WITH MACHINES, PROCESSES OR TECHNIQUES.
10. DOING WORK IN WHICH YOU CAN SOON SEE CLEAR RESULTS.

CHOOSE ONE INTEREST AT A TIME FROM THE ABOVE LIST.
YOU CAN CHOOSE EITHER ONE YOU'D LIKE OR ONE  YOU'D DISLIKE.
IF IT'S ONE YOU'D LIKE TYPE AN L BEFORE ITS NUMBER LIKE THIS: L8 .
IF IT'S ONE YOU'D DISLIKE TYPE A D BEFORE ITS NUMBER LIKE THIS: D5.
(NOW I PUT A SPACE OR ANYTHING ELSE BETWEEN THE LETTER AND NUMBER.)

PLEASE TYPE YOUR FIRST INTEREST NOW.  (REMEMBER THE L OR D BEFORE THE NUMBER)

L1

TOTAL:628          PREVIOUS:628          NOW:60

DO YOU WANT TO ADD ANOTHER INTEREST CAREERPLANNER? (Y OR N)

Y

OKAY THEN, TYPE THE NUMBER OF ANOTHER INTEREST NOW. (REMEMBER THE L OR D BEFORE THE NUMBER.)
```

```
L1      .

TOTAL:628          PREVIOUS:60          NOW:52

DO YOU WANT TO ADD ANOTHER INTEREST CAREERPLANNER? (Y OR N)

N

YOU WE CAN DO ONE OF THE FOLLOWING. WHAT SHALL IT BE CAREERPLANNER?
 1. CHANGE YOUR ANSWER(S) IN  INTERESTS    2. CHANGE A PREVIOUS ANSWER
 3. GO TO YOUR NEXT TOPIC IN  EXPLORE      4. START  EXPLORE  OVER AGAIN
 5. LEAVE  EXPLORE                         6. LEAVE THE SYSTEM

3

YOUR TEMPERAMENTS CAN YIELD USEFUL CLUES ABOUT OCCUPATIONS THAT YOU MIGHT LIKE CAREERPLANNER.  PLEASE HAVE A LOOK AT
THE FOLLOWING LIST OF TEMPERAMENT FACTORS.

 1. PERFORMING A VARIETY OF DUTIES THAT CHANGE OFTEN.
 2. REPEATING THE SAME SIMPLE TASK FOLLOWING SET PROCEDURES.
 3. FOLLOWING EXACTLY THE INSTRUCTIONS OF OTHERS AND NOT MAKING MANY DECISIONS.
 4. WORKING INDEPENDENTLY AND TAKING RESPONSIBILITY FOR YOUR WORK OR THE WORK OF OTHERS.
 5. GAINING THE CO-OPERATION OF HELPERS, CO-WORKERS, OR CLIENTS.
 6. INFLUENCING THE OPINIONS, ATTITUDES, OR DECISIONS OF OTHERS.
 7. PERFORMING TASKS THAT ARE STRESSFUL OR RISKY, AND THAT REQUIRE SELF-CONTROL.
 8. MAKING DECISIONS BASED ON PERSONAL KNOWLEDGE, EXPERIENCE, AND INTERPRETATION OF INFORMATION.
 9. MAKING DECISIONS BASED ON CONCRETE, REPRODUCIBLE EVIDENCE ACCORDING TO MEASURABLE STANDARDS.
10. EXPRESSING YOUR FEELINGS, IDEAS, AND PERSONALITY THROUGH YOUR WORK.
11. ENSURING THAT YOUR WORK MEETS STRICT STANDARDS OR SPECIFICATIONS.

CHOOSE ONE TEMPERAMENT AT A TIME. YOU CAN CHOOSE EITHER ONE YOU'D LIKE OR ONE YOU'D DISLIKE.
IF IT'S ONE YOU'D LIKE, TYPE AN L BEFORE IT'S NUMBER LIKE THIS: L7.
IF IT'S ONE YOU'D DISLIKE TYPE A D BEFORE IT'S NUMBER LIKE THIS: D3.
(DON'T PUT A SPACE OR ANYTHING ELSE BETWEEN THE LETTER AND THE NUMBER)

PLEASE TYPE YOUR FIRST TEMPERAMENT NOW.(REMEMBER TO PUT EITHER L OR D BEFORE THE NUMBER).

L6

TOTAL:628          PREVIOUS:52          NOW:28

DO YOU WANT TO ADD ANOTHER TEMPERAMENT FACTOR? (Y OR N)

Y


OKAY THEN. TYPE IN ANOTHER TEMPERAMENT NOW. (REMEMBER THE L OR D BEFORE THE NUMBER)

D2
```

```
TOTAL:28          PREVIOUS:28          NOW:28

DO YOU WANT TO ADD ANOTHER TEMPERAMENT FACTOR? (Y OR N)

Y

WHAT THEN, TYPE IN ANOTHER TEMPERAMENT NOW. (REMEMBER THE L OR D BEFORE THE NUMBER)

L8

TOTAL:29          PREVIOUS:28          NOW:28

DO YOU WANT TO ADD ANOTHER TEMPERAMENT FACTOR? (Y OR N)

N

NOW WE CAN DO ONE OF THE FOLLOWING. WHICH SHALL IT BE CAREERPLANNER?
 1. CHANGE YOUR ANSWER(S) IN  TEMPERAMENTS     2. CHANGE A PREVIOUS ANSWER
 3. GO TO YOUR NEXT TOPIC IN  EXPLORE          4. START  EXPLORE  OVER AGAIN
 5. LEAVE  EXPLORE                             6. LEAVE THE SYSTEM

5

EXPLORING OCCUPATIONS THROUGH YOUR ABILITIES CAN BE REWARDING CAREERPLANNER! HAVE YOU TAKEN THE GENERAL APTITUDE TEST
BATTERY (GATB)?  (Y OR N).

N

WHAT WE WILL DO THEN IS LET YOU ESTIMATE YOUR APTITUDE LEVELS. IF YOU WISH TO TAKE A TEST TO DETERMINE YOUR LEVELS OF
APTITUDE,  SEE YOUR COUNSELOR AFTER YOU LEAVE THE TERMINAL.
HAVE YOU FILLED IN YOUR ESTIMATES OF YOUR APTITUDES ON YOUR TRAVEL GUIDE? (Y OR N)

N

OKAY. I M GOING TO ASK YOU TO ESTIMATE HOW YOU COMPARE WITH OTHER PEOPLE OF YOUR OWN AGE IN 9 DIFFERENT TYPES OF
ABILITIES.
I LL ASK YOU A QUESTION ABOUT EACH ABILITY. YOU LL RATE YOURSELF ON EACH SEPARATELY BY ANSWERING WITH THE NUMBER YOU
CONSIDER APPROPIATE FROM THE FOLLOWING SCALE:

 1. LEVEL ONE   - TOP 10% (HIGH)
 2. LEVEL TWO   - TOP 1/3 BUT NOT TOP 10% (ABOVE AVERAGE)
 3. LEVEL THREE - MIDDLE 1/3 (AVERAGE)
 4. LEVEL FOUR  - BOTTOM 1/3 BUT NOT BOTTOM 10% (BELOW AVERAGE)
 5. LEVEL FIVE  - BOTTOM 10% (LOW)
 6. NOT SURE
6.  HOW DO YOU COMPARE WITH OTHERS IN YOUR GENERAL LEARNING ABILITY?  THAT IS YOUR ABILITY TO  CATCH ON  TO NEW THINGS.
(YOUR ANSWER MUST BE ONE OF THE FOLLOWING: 1,2,3,4,5 OR 6 ACCORDING TO THE RATING SCALE ABOVE).

2
```

TOTAL: 629 PREVIOUS: 25 NOW: 18

WHAT WOULD YOU LIKE TO DO NOW?

1. SEE WHICH OCCUPATIONS REMAIN 2. CHANGE AN ANSWER IN 'APTITUDES'
3. GO ON WITH 'APTITUDES' 4. LEAVE 'APTITUDES' AND GO ON

3

V. HOW DO YOU COMPARE WITH OTHERS IN YOUR ABILITY TO READ AND UNDERSTAND SENTENCES AND PARAGRAPHS IN BOOKS AND MAGAZINES? (1,2,3,4,5 OR 6).

2

TOTAL: 628 PREVIOUS: 18 NOW: 16

WHAT WOULD YOU LIKE TO DO NOW?

1. SEE WHICH OCCUPATIONS REMAIN 2. CHANGE AN ANSWER IN 'APTITUDES'
3. GO ON WITH 'APTITUDES' 4. LEAVE 'APTITUDES' AND GO ON

3

N. HOW DO YOU COMPARE IN YOUR ABILITY TO WORK QUICKLY AND ACCURATELY WITH NUMBERS (ARITHMETIC)? (1,2,3,4,5 OR 6).

3

TOTAL: 628 PREVIOUS: 16 NOW: 14

WHAT WOULD YOU LIKE TO DO NOW?

1. SEE WHICH OCCUPATIONS REMAIN 2. CHANGE AN ANSWER IN 'APTITUDES'
3. GO ON WITH 'APTITUDES' 4. LEAVE 'APTITUDES' AND GO ON

3

S. HOW DO YOU COMPARE WITH OTHERS IN YOUR ABILITY TO PICTURE SHAPES IN SPACE? (AS IN READING BLUEPRINTS AND SOLVING PROBLEMS IN GEOMETRY). THIS IS THE ABILITY TO VISUALIZE OBJECTS IN 2 OR 3 DIMENSIONS. (1,2,3,4,5 OR 6).

3

TOTAL: 628 PREVIOUS: 14 NOW: 13

WHAT WOULD YOU LIKE TO DO NOW?

1. SEE WHICH OCCUPATIONS REMAIN 2. CHANGE AN ANSWER IN 'APTITUDES'
3. GO ON WITH 'APTITUDES' 4. LEAVE 'APTITUDES' AND GO ON

3

P. HOW DO YOU THINK YOU COMPARE WITH OTHERS IN YOUR ABILITY TO NOTICE SLIGHT DIFFERENCES IN SHAPES, SHADINGS OF

PICTURES, WIRING AND LENGTHS OF LINES, FLAWS IN MATERIALS AND SLIGHT IMPERFECTIONS IN MACHINE PARTS? (1,2,3,4,5 OR 6).

3

TOTAL: 628 PREVIOUS: 13 NOW: 13

WHAT WOULD YOU LIKE TO DO NOW?

1. SEE WHICH OCCUPATIONS REMAIN 2. CHANGE AN ANSWER IN 'APTITUDES'
3. GO ON WITH 'APTITUDES' 4. LEAVE 'APTITUDES' AND GO ON

1

FINE. I'LL USE THE RATING(S) YOU HAVE GIVEN ME SO FAR FOR YOUR APTITUDES. BUT WE WON'T BOTHER WITH THE REST.
LET'S GO ON TO SOMETHING ELSE.
SOME PEOPLE CONSIDER WAGE/SALARY TO BE IMPORTANT IN CHOOSING THEIR OCCUPATION. OFTEN, HOWEVER, OTHER THINGS CAN BE MUCH MORE IMPORTANT IN DETERMINING JOB SATISFACTION CAREER PLANNER. I ENCOURAGE YOU TO BE AS FLEXIBLE AS YOU CAN ABOUT THE AMOUNT OF MONEY YOU FEEL YOU WANT.
PLEASE SELECT THE LEVEL OF WAGE/SALARY WHICH YOU FEEL WOULD SATISFY YOU (AS AN EXPERIENCED WORKER IN AN OCCUPATION).

1. MINIMUM WAGE - $8,999 PER YEAR (MINIMUM WAGE-$4.33/HOUR)
2. $9,000 - $11,999 PER YEAR ($4.34-$5.77/HOUR)
3. $12,000 - $14,999 PER YEAR ($5.78-$7.21/HOUR)
4. $15,000 - $17,999 PER YEAR ($7.22-$8.65/HOUR)
5. $18,000 - $20,999 PER YEAR ($8.66-$10.10/HOUR)
6. $21,000 - $24,999 PER YEAR ($10.11-$12.02/HOUR)
7. $25,000 - $29,999 PER YEAR ($12.03-$14.42/HOUR)
8. MORE THAN $30,000 PER YEAR ($14.43/HOUR)
9. I'M NOT SURE. LET'S GO ON.

5

TOTAL: 628 PREVIOUS: 13 NOW: 11

WHAT WOULD YOU LIKE TO DO NOW?

1. SEE WHICH OCCUPATIONS REMAIN 2. CHANGE YOUR LAST ANSWER
3. CHANGE A PREVIOUS ANSWER 4. GO TO YOUR NEXT TOPIC IN 'EXPLORE'
5. START 'EXPLORE' OVER AGAIN 6. LEAVE 'EXPLORE'
7. LEAVE THE SYSTEM

1

FOR THE PIEDMONT:
IN VIEW OF YOUR ANSWERS TO THIS POINT, I THINK YOU SHOULD CONSIDER THE FOLLOWING OCCUPATIONS:

1110	CHIEF EXECUTIVES AND GENERAL ADMINISTRATORS
1130	JUDICIAL, PUBLIC SAFETY, AND CORRECTIONS ADMINISTRATORS
1270	SOCIAL SCIENCES AND RELATED MANAGERS
1290	EDUCATION AND RELATED ADMINISTRATORS
2050	SOCIAL WORKERS
2330	SECONDARY SCHOOL TEACHERS
2340	ADULT EDUCATION TEACHERS
2350	SPECIAL EDUCATION TEACHERS
2830	PODIATRISTS
2890	HEALTH DIAGNOSING AND TREATING PRACTITIONERS

1220 THERAPISTS

HERE ARE YOUR ANSWERS WHICH I USED TO FIND THE ABOVE OCCUPATIONS.
THE L S ARE FOR THE TOPICS YOU TOLD ME YOU LIKED OR WANTED.
THE D S ARE FOR THE TOPICS YOU TOLD ME YOU DID NOT LIKE OR DID NOT WANT.
THE OTHER VALUES ARE YOUR ACTUAL ANSWERS TO MY QUESTIONS.

INTERESTS	APTITUDES	TEMPERAMENTS	ENVIR CONDS	EMP	HOURS	PHYS DEMS	PHYSICAL ACTIVITY IN/OUT	WORK FIELDS 1 1 1 1 2 2 2 3 3 3 4 4 5 5 6 6 6 7 8 9 1 5 7 9 2 6 9 2 6 7 0 5 0 5 0 3 6 1 1 1
123456/890	GVNSPQKFM	123456/89XY	ED 123456	001	WAGE 12345	123456/		

DL 22333 D L L 3

THE ABOVE OCCUPATIONS SEEM REASONABLE TO ME AS I REVIEW THE THINGS YOU HAVE TOLD ME. IF SOME SEEM UNSUITABLE TO YOU, YOU MIGHT CONSIDER CHANGING ONE OR MORE OF YOUR ANSWERS.

WHAT WOULD YOU LIKE TO DO NOW CAREERPLANNER?
1. CHANGE ONE OF YOUR ANSWERS
2. GET INFORMATION ON ANY OF THESE OCCUPATIONS
3. FIND OUT WHY AN OCCUPATION WASN'T LISTED
4. GO TO YOUR NEXT TOPIC IN EXPLORE
5. START EXPLORE OVER AGAIN
6. LEAVE EXPLORE
7. LEAVE THE SYSTEM

3

FINE. PLEASE TYPE IN THE 4-DIGIT CODE NUMBER OF THE OCCUPATION YOU WOULD LIKE TO HAVE SEEN ON THE LIST.

2120

VOCATIONAL AND EDUCATIONAL COUNSELORS .....Is THIS RIGHT? (Y OR N).

Y

2120 VOCATIONAL AND EDUCATIONAL COUNSELORS
THAT OCCUPATION WAS ELIMINATED FROM YOUR LIST BECAUSE:
APTITUDES THIS OCCUPATION GENERALLY REQUIRES HIGHER LEVELS OF APTITUDE THAN YOU APPEAR TO POSSESS IN THE FOLLOWING AREA(S):
G. GENERAL LEARNING ABILITY
V. VERBAL APTITUDE

WAGE/SALARY THIS OCCUPATION DOES NOT PROVIDE EARNINGS AS HIGH AS YOU SAID YOU WANTED.

WHAT WOULD YOU LIKE TO DO NOW? (SELECT ONE).
1. FIND OUT WHY ANOTHER WASN'T LISTED
2. CHANGE ONE OF YOUR ANSWERS TO THIS POINT
3. GO TO YOUR NEXT TOPIC IN EXPLORE
4. START EXPLORE OVER AGAIN
5. LEAVE EXPLORE
6. LEAVE THE SYSTEM

5

WHAT SHALL WE DO NOW CAREERPLANNER?

```
 1. EXPLORE OCCUPATIONS                2. GET SPECIFIC INFORMATION
 3. COMPARE OCCUPATIONS                4. FIND RELATED OCCUPATIONS
 5. GO TO THE EDUCATION SYSTEM         6. LEAVE THE SYSTEM

3

OKAY CAREERPLANNER. WE CAN COMPARE TWO OR THREE OCCUPATIONS AT A TIME.  WHICH WILL IT BE ?
 1. COMPARE 2 OCCUPATIONS (TYPE IN 1).
 2. COMPARE THREE OCCUPATIONS (TYPE IN 2).

2

PLEASE TYPE IN THE 4-DIGIT CODE NUMBER OF THE FIRST OCCUPATION NOW.

2032

SOCIAL WORKERS .....IS THIS RIGHT?  (Y OR N).

Y

GOOD! TYPE THE NUMBER OF YOUR 2ND OCCUPATION NOW.

1283

EDUCATION AND RELATED ADMINISTRATORS .....IS THIS RIGHT?  (Y OR N).

Y

OKAY. PLEASE TYPE THE NUMBER OF YOUR 3RD OCCUPATION.

3030

THERAPISTS .....S THIS RIGHT?  (Y OR N).

Y

WOULD YOU LIKE TO SEE THE LIST OF TOPICS AVAILABLE IN COMPARE? (Y OR N).

Y

GOOD! HERE ARE THE TYPES OF INFORMATION ABOUT THESE OCCUPATIONS WHICH YOU CAN COMPARE. SELECT AS MANY AS YOU WISH.
(PLEASE TYPE A COMMA BETWEEN THE NUMBERS LIKE THIS:  4,9,2,10)
 1. INTERESTS                  2. APTITUDES                  3. TEMPERAMENTS
 4. EDUCATION LEVEL            5. ENVIRONMENTAL CONDITIONS   6. EMPLOYMENT OUTLOOK
 7. WAGE/SALARY                8. HOURS OF WORK/TRAVEL       9. PHYSICAL DEMANDS
10. PHYSICAL ACTIVITIES        11. INDOOR/OUTDOOR CONSIDERATIONS 12. TRAINING TIME
13. SIMILAR DOT OCCUPATIONS    14. ALL OF THESE TOPICS.

14
HERE IS YOUR COMPARISON:
```

2032 SOCIAL WORKERS

THESE PEOPLE COUNSEL AND GIVE AID TO PEOPLE WHO NEED HELP FROM SOCIAL SERVICE AGENCIES. THEY VISIT CLIENTS AND ARRANGE FOR THEM TO GET THE HELP THEY NEED.

1283 EDUCATION AND RELATED ADMINISTRATORS

PEOPLE IN THESE JOBS PLAN, DIRECT, AND CONTROL SPECIAL TRAINING PROGRAMS OFFERED IN SUCH PLACES AS SCHOOLS, LIBRARIES, DAYCARE CENTERS, AND PRISONS.

3030 THERAPISTS

THESE PEOPLE TREAT PATIENTS TO HELP RELIEVE THEIR PAIN AND TO DEVELOP OR RESTORE THEIR PHYSICAL HEALTH. THEY TREAT PATIENTS USING SUCH MEANS AS EXERCISE, MASSAGE, WATER, LIGHT, MUSIC, AND ART.

	2032 SOCIAL WORKERS	1283 EDUCATION AND RELATED ADMINISTRATORS	3030 THERAPISTS
INTERESTS	2. DEALING WITH PEOPLE AS CLIENTS,CUSTOMERS,ASSOCIATES 4. WORKING TO IMPROVE THE SOCIAL CONDITIONS OF OTHERS. 5. DIRECTING, ORGANIZING OR PLANNING AN ACTIVITY. 6. STUDYING OR COMMUNICATING ABOUT PEOPLE OR ANIMALS.	2. DEALING WITH PEOPLE AS CLIENTS,CUSTOMERS,ASSOCIATES 4. WORKING TO IMPROVE THE SOCIAL CONDITIONS OF OTHERS. 5. DIRECTING, ORGANIZING OR PLANNING AN ACTIVITY. 6. STUDYING OR COMMUNICATING ABOUT PEOPLE OR ANIMALS.	2. DEALING WITH PEOPLE AS CLIENTS,CUSTOMERS,ASSOCIATES 4. WORKING TO IMPROVE THE SOCIAL CONDITIONS OF OTHERS. 5. DIRECTING, ORGANIZING OR PLANNING AN ACTIVITY. 6. STUDYING OR COMMUNICATING ABOUT PEOPLE OR ANIMALS. 7. ANALYTICAL, SCIENTIFIC OR TECHNICAL WORK. 9. WORKING WITH MACHINES, EQUIPMENT OR PROCESSES.
APTITUDES	-ABOVE AVERAGE G. GENERAL LEARNING ABILITY V. VERBAL APTITUDE -AVERAGE N. NUMERICAL APTITUDE	-ABOVE AVERAGE G. GENERAL LEARNING ABILITY V. VERBAL APTITUDE -AVERAGE N. NUMERICAL APTITUDE P. FORM PERCEPTION Q. CLERICAL PERCEPTION	-ABOVE AVERAGE G. GENERAL LEARNING ABILITY V. VERBAL APTITUDE -AVERAGE N. NUMERICAL APTITUDE S. SPATIAL PERCEPTION P. FORM PERCEPTION Q. CLERICAL PERCEPTION K. EYE-HAND COORDINATION F. FINGER DEXTERITY M. MANUAL DEXTERITY
TEMPERAMENTS	1. HAVING MANY DUTIES WITH FREQUENT CHANGE. 4. WORKING INDEPENDENTLY AND TAKING RESPONSIBILITY. 5. GAINING THE CO-OPERATION OF CO-WORKERS, HELPERS OR	1. HAVING MANY DUTIES WITH FREQUENT CHANGE. 4. WORKING INDEPENDENTLY AND TAKING RESPONSIBILITY. 5. GAINING THE CO-OPERATION OF CO-WORKERS, HELPERS OR	1. HAVING MANY DUTIES WITH FREQUENT CHANGE. 4. WORKING INDEPENDENTLY AND TAKING RESPONSIBILITY. 5. GAINING THE CO-OPERATION OF CO-WORKERS, HELPERS OR

	CLIENTS. 4. INFLUENCING PEOPLE'S OPINIONS ATTITUDES AND DECISIONS. 8. MAKING DECISIONS BASED ON PERSONAL KNOWLEDGE AND EXPERIENCE.	CLIENTS. 6. INFLUENCING PEOPLE'S OPINIONS ATTITUDES AND DECISIONS. 8. MAKING DECISIONS BASED ON PERSONAL KNOWLEDGE AND EXPERIENCE.	CLIENTS. 5. INFLUENCING PEOPLE'S OPINIONS ATTITUDES AND DECISIONS. 8. MAKING DECISIONS BASED ON PERSONAL KNOWLEDGE AND EXPERIENCE. 9. MAKING DECISIONS BASED ON CONCRETE EVIDENCE.
EDUCATION LEVEL	BACHELOR'S DEGREE	BACHELOR'S DEGREE	BACHELOR'S DEGREE
INDOOR/OUTDOOR	MOST JOBS INDOORS	INDOORS	INDOORS
ENVIRONMENTAL CONDITIONS	-NORMAL ENVIRONMENT	-NORMAL ENVIRONMENT	-SOME JOBS - DAMP OR WET CONDITIONS -SOME JOBS - DUST/FUMES/ODORS
EMPLOYMENT OUTLOOK	POOR FOR MOST JOBS	LIMITED IN NC	VERY GOOD
WAGE/SALARY RANGE	$9,000 ($4.33/HR) TO $24,000 ($11.54/HR)	$10,500 ($5.05/HR) TO $30,000 ($14.42/HR)	$9,500 ($4.57/HR) TO $25,000 ($12.02/HR)
HOURS OF WORK/TRAVEL	-NORMAL WORK WEEK	-NORMAL WORK WEEK	-NORMAL WORK WEEK
PHYSICAL DEMANDS	MOST JOBS - VERY LIGHT	VERY LIGHT	MOST JOBS - LIGHT
PHYSICAL ACTIVITIES	-SPEAKING -HEARING -SEEING	-SPEAKING -HEARING	-REACHING/HANDLING/FINGERING/FEELING -SPEAKING -HEARING -SEEING
TRAINING TIME	MIN: 3 MOS./MAX: 10 YRS.	MIN: 2 YRS./MAX: 10 YRS.	MIN: 1 YR./MAX: 10 YRS.
SIMILAR DOT OCCUPATIONS	189.267-010 FIELD REPRESENTATIVE 195.107-010 CASEWORKER 195.107-030 SOCIAL WORKER, MEDICAL 195.167-030 PAROLE OFFICER 195.167-034 PROBATION OFFICER 195.367-010 CASE AIDE 309.354-010 HOMEMAKER	092.117-010 DIRECTOR, PRESCHOOL 094.117-010 DIRECTOR, COMMISSION FOR THE BLIND 097.167-010 DIRECTOR, VOCATIONAL TRAINING 099.117-010 DIRECTOR, EDUCATIONAL PROGRAM 100.117-010 LIBRARY DIRECTOR	076.101-010 AUDIOLOGIST 076.107-010 SPEECH PATHOLOGIST 076.121-010 OCCUPATIONAL THERAPIST 076.121-014 PHYSICAL THERAPIST 076.124-010 MANUAL-ARTS THERAPIST 076.124-014 RECREATIONAL THERAPIST 079.361-010 RESPIRATORY THERAPIST

WOULD YOU LIKE TO COMPARE DIFFERENT OCCUPATIONS? (Y OR N).

IF YOU WOULD LIKE MORE INFORMATION ON ANY OCCUPATION, PLEASE ASK TO SEE THE 'STANDARD OCCUPATIONAL CLASSIFICATION DESCRIPTION BRIEFS'. THESE BRIEFS CONTAIN DETAILED DESCRIPTIONS OF THE SOC OCCUPATIONS. THEY ALSO CONTAIN INFORMATION NOT FOUND IN MY FILE, INCLUDING: LICENSING REQUIREMENTS, INFORMATION FOR THE DISABLED, PLACES OF EMPLOYMENT, CAREER LADDERS, A LIST OF ALL THE DOT OCCUPATIONS FOR EACH SOC OCCUPATION, AND MUCH MORE. IF YOU ARE INTERESTED IN SEEING MORE INFORMATION ABOUT A 'SIMILAR DOT OCCUPATION', ASK TO SEE THE '4TH EDITION DICTIONARY OF OCCUPATIONAL TITLES'. THESE AND OTHER MATERIALS ARE AVAILABLE IN THIS OFFICE.
WHAT SHALL WE DO NOW CAREERPLANNER?

1. EXPLORE OCCUPATIONS
2. GET SPECIFIC INFORMATION
3. COMPARE OCCUPATIONS
4. FIND RELATED OCCUPATIONS
5. GO TO THE EDUCATION SYSTEM
6. LEAVE THE SYSTEM

6

OKAY CAREERPLANNER, I'VE ENJOYED TALKING TO YOU. DURING OUR CONVERSATION I'VE SUGGESTED OCCUPATIONS TO YOU WHICH I FEEL -- BASED ON WHAT YOU'VE TOLD ME ABOUT YOURSELF -- ARE WORTH THINKING ABOUT. YOU MAY BE SURPRISED AT SOME OF THE OCCUPATIONS I'VE SUGGESTED. YOU MAY EVEN THINK SOME WOULD BE COMPLETELY 'WRONG' FOR YOU.

BEFORE YOU REJECT ANY OF THEM THOUGH, PLEASE TAKE A MOMENT TO CONSIDER WHY I MAY HAVE MENTIONED THEM TO YOU. SOMETHING WHICH YOU SAID DURING THIS CONVERSATION HAS LED ME TO BELIEVE THAT EACH OF THE OCCUPATIONS I LISTED FOR YOU COULD BE WORTH THINKING ABOUT. IN THE SAME WAY, IF I DIDN'T SUGGEST ANY OCCUPATIONS WHICH YOU HAD IN MIND BEFORE WE GOT TOGETHER, THINK ABOUT WHAT YOU MIGHT HAVE SAID TO ME WHICH CAUSED ME TO DECIDE THEY MAY NOT BE 'RIGHT' FOR YOU.

REMEMBER, OUR OBJECTIVE HAS BEEN TO DECIDE WHICH THINGS ARE MOST IMPORTANT TO YOU IN CHOOSING A CAREER AND TO SUGGEST SOME OCCUPATIONS FOR YOU TO CONSIDER. I'M AFRAID I'M JUST NOT CLEVER ENOUGH TO TELL YOU EXACTLY WHAT YOU SHOULD DO, FOR ONE THING, ALTHOUGH IT EMBARRASSES ME TO ADMIT IT, THERE ARE MANY THINGS ABOUT OCCUPATIONS THAT I DON'T KNOW. HOWEVER, ALL OCCUPATIONS IN THE U.S. ARE DESCRIBED IN A DICTIONARY OF OCCUPATIONAL TITLES (DOT) WHICH YOUR COUNSELOR HAS. YOU CAN USE THE 9-DIGIT NUMBERS I GAVE YOU IN THE 'SPECIFIC' AND 'COMPARE' ROUTES TO FIND THAT OCCUPATION, AND MANY OTHER SIMILAR ONES. ASK YOUR COUNSELOR IF YOU AREN'T SURE HOW.

I REALLY THINK IT WOULD BE WORTH YOUR WHILE TO DISCUSS YOUR PRINTOUT IN DETAIL WITH YOUR COUNSELOR - ESPECIALLY PARTS WHERE YOU FIND IT DIFFICULT TO ACCEPT SOME THINGS I HAVE TOLD YOU. I'M POSITIVE YOU WILL FEEL MUCH BETTER ABOUT THIS EXPERIENCE IF YOU DO.

PERHAPS WE'LL TALK TO EACH OTHER AGAIN SOMETIME. IN THE MEANTIME, I WISH YOU WELL IN YOUR CAREER PLANNING. GOODBYE FOR NOW CAREERPLANNER.

YOU ARE UNASSIGNED ** TIME ** 11:12:19

CONVERSATION SUMMARY FOR CAREERPLANNER ON 09/21/80 AT 11:12:19

********OCCUPATIONS EXPLORE********

TOPICS USED	FACTORS USED	FACTORS IN EFFECT	AREA	NUMBER OF OCCUPATIONS REMAINING

4145 SPORTING GOODS SALESPERSONS

WHAT THE WORK IS ABOUT

These people sell sporting goods or athletic equipment. They sell items such as hunting, fishing, camping, skiing, or golfing equipment.

WHAT GENERAL THINGS YOU WOULD DO

- Greet customers on the sales floor
- Advise customers about different types of goods
- Sell sporting goods and equipment
- Prepare sales slips or contracts
- Receive payments or arrange credit
- Put new sporting goods on display

WHAT YOU MUST BE ABLE TO DO

- Read and write well
- Speak clearly and listen carefully
- Pay close attention to details in written work
- Work with fractions, decimals, and percentages
- Talk easily with all kinds of people
- Reason and make judgments
- Find and correct errors in words and numbers
- Present information and ideas clearly

WHAT SPECIFIC ACTIVITIES YOU MIGHT PERFORM

- Sell golf clubs, tennis rackets, and track shoes
- Advise customers on type of equipment, such as length of golf clubs or size of grip on tennis rackets
- Explain care of equipment, such as how to properly clean hunting rifles
- Tell customers about hunting and fishing regulations
- Repair sporting goods, such as tennis rackets or skis

WHERE YOU WOULD WORK

- Stores that sell sporting goods and athletic equipment
- Companies that sell sporting goods and athletic equipment wholesale

WHAT THE WORK PLACE IS LIKE

These people work in stores or at companies that sell goods to stores. Store SALESPERSONS must stand on their feet for long periods of time. People that represent sporting goods companies spend much time traveling. They may work long or irregular hours. Some receive salaries or wages, while others receive commissions.

HOW YOU WOULD PREPARE FOR AND ENTER THIS WORK

Employers usually prefer to hire people for these jobs who have a high school education. Some prefer those who have college training. Many large businesses have programs to train workers. Usually no previous work experience is necessary. Training may take from a few days up to 2 years.

WHAT ARE YOUR OPPORTUNITIES

Experienced SALES REPRESENTATIVES who show leadership and sales ability may advance to jobs as SUPERVISORS or SALES MANAGERS.

IF YOU HAVE A DISABILITY

Only a few disabilities are mentioned here as examples. Job duties and equipment can be changed. Don't count yourself out. Talk your problems over with your counselor or teacher. More employers are hiring disabled people if they are trained to do the work.

Employers who receive federal grants or contracts are now required to make "reasonable accommodations" for qualified disabled people. "Reasonable accommodations" can include: (1) making facilities accessible to disabled people, (2) restructuring jobs, (3) modifying work schedules, (4) acquiring new equipment or modifying existing equipment and (5) providing readers or interpreters.

If you have a heart condition or have recovered from an emotional illness, you can do this work with a doctor's approval. If you have epilepsy, allergies, or diabetes, and your condition is controlled, you can also do this work with a doctor's approval.

You need one arm trained to write, type, and use equipment. You can do this work if you have minor leg problems but are able to walk, climb, jump, bend, or stoop. If you use leg braces, artificial legs, crutches, canes, or a wheelchair, you can consider this work.

You can also consider many of these jobs if you have hearing problems and can read lips, write, or sign. Telephone calls can be made with the help of other workers.

Appendix C

The Oregon Vocational Rehabilitation Division Administrative Issues Identification And Tracking System

Gerald V. Mann and Ross T. Moran

One of the activities of the Model Evaluation Unit was to develop a Conceptual Framework to describe the process by which policy issues are identified and analyzed and how policy decisions are made, implemented, and evaluated. Some policy decisions are made in seconds by a single individual in the organization with little or no interaction with others. At the other end of the continuum are policy issues which require a very large expenditure of staff time and resources over extended periods. Involvement of a wide variety of staff of the agency, and perhaps from outside the agency, are sometimes required to gather, study and analyze data before a decision is reached. Even after the policy decision has been made, the amount of staff time and resources required for its implementation can vary enormously. A complex program such as the Vocational Rehabilitation Division will have at any given time a substantial number of such policy issues in various stages of analysis, decision making, or implementation.

The identification of a policy issue on which staff time and resources are to be committed is an administrative decision which should be made deliberately. Such decisions are often made in an environment of constantly shifting priorities and staff availability and capability.

Given the number of issues, the shifting priorities, the staffing changes, and a general crisis orientation common to many human service programs today, it is not uncommon for important policy issues to become lost, leaving the Administrator disadvantaged by not having vital data when it is required.

Without belaboring the point, we believe that most administrators would agree that a system is required to identify issues with policy implications, to consciously assign staff to analyze such issues and to propose alternatives and to complete the action through the implementation of the Administra tor's decision. Such a system should provide the Administrator with periodic reports so that changes may be made when necessary to insure that deadlines are met and that limited resources are focused on the most important activities. Such a system assures accountability.

The OVRD Issues Identification and Tracking System is an attempt to provide such a rational system of accountability as an adjunct to the Conceptual Framework.

The system begins with the recognition by the Administrator or the Deputy Administrator that a decision should not be made on a specific issue without study and that the issue is important enough to allocate staff time and resources to develop it into a decision package. This recognition may be reached by the Administrator working singly, it may evolve from discussion with others, or it may become apparent from memoranda or routine management data.

When the decision is made to expend staff time and resources on a particular issue, the following are required:

1. Identification of the issue;
2. Assignment and notification of a responsible lead person;
3. Assignment of an anticipated completion date or the date when a decision package is due; and
4. Notification of the person who maintains the Issues Identification and Tracking System.

Usually the above requirements are completed during discussions at an administrative meeting, although they could also be completed by an assignment memorandum. Commonly, an issue will surface during the regularly scheduled meetings between the Administrator and other staff members. Discussion then follows on such matters as when the decision is needed, availability of data, priority of this issue relative to others, relationship of this issue to the agency's mission and to the missions of sister agencies, and which staff member is best able to develop the decision package. A verbal assignment is then made, which, in most instances, is followed by a written assignment from the supervisor to the responsible person. A copy of the written assignment is sent to the monitor who maintains the Issues Identification and Tracking System and the issue is added to the list of those on which the Administrator will receive monthly progress reports.

The system began in November 1979 with 32 issues. As of May 31, 1980, a total of 12 issues had been completed and nine new issues added. One issue was dropped prior to completion because it was not attainable, and two issues were renumbered to group them with related efforts. Thus, in our experience, there has been an average of slightly more than 30 issues in the tracking system at any one time. Caution is exercised to track only those deemed of considerable importance to the agency, including those one-time actions required by higher authority but not including regular repetitive reports. Such repetitive reports have their own tickler system to insure that timelines are met.

During the first six months, 23 different staff persons have been assigned responsibility for one or more issues, with no person assigned more than three at any one time. Anticipated completion time has varied from two to 18 months.

Although a complex numbering system is currently in use, we recommend a simple sequential numbering of issues be adopted for identification purposes.

A word processing system is used to store the complete tracking system. During the last few days of each month a reminder memorandum is generated, using the word processor, for each issue being tracked. These memoranda are then distributed to the persons responsible, who complete a handwritten progress report on each issue by the fifth working day of the following month. Only a few minutes are required for each person responsible to handwrite a concise progress report and route it to one of the agency Assistant Administrators who check each report, underscore any delays or roadblocks identified, assign an appropriate progress symbol and route it through the Issues Tracking monitor to the word processing operator for text editing. The monthly progress reports on each issue vary in length from a single sentence to as much as a half-page of single-spaced typing. Care is exercised to limit the length of the progress report and include only that information required by the Administrator for review purposes.

In addition to the narrative paragraph on each issue the name of the responsible person, the due date and progress rating are also provided.

The report is prepared on the word processor using legal sized paper inserted sideways. The report is then reduced through Xerography to standard-sized paper and printed using dual side copying. This has enabled the entire report to be printed on only two sheets of paper.

A transmittal memo is prepared for the agency's top management outlining progress for the month. A copy of the report is also posted for the information of the entire administrative staff.

A copy of our report for the month of November, 1981 is attached. It is atypically long in-as-much-as it was also used to help orient the agency's new top Administrator, but is still representative of the types of issues being tracked. Also included is a list of the 32 issues completed during the first 23 months of the system's operation.

We believe this system provides a reasonable degree of accountability with a minimum of staff time expended. It also provides an information flow to all appropriate staff on a variety of vital issues. Finally, the Administrator's Office is fully informed and can take action to shift priorities, resources, and staff in whatever way necessary to accomplish that which is most important.

Oregon Vocational Rehabilitation Division
"Issues Assignment Memorandum"

To: Date:

From:

Subject: VRD Issues Tracking

You have been assigned responsibility for a VRD issue on which the Administrator has determined that staff time and resources will be expended. In order that the Administrator and others may be kept informed on the progress of this issue, a report is required from you by the fifth working day of each month. The report should concisely describe those activities related to the issue which were completed during the previous month. When appropriate, you should also recommend changes in anticipated completion date or any other matters of which the Administrator should be aware concerning this issue.

A consolidated report of progress on all issues being tracked will be prepared monthly and a copy will be supplied to each responsible person. Please retain the assignment for reference.

A reminder statement for each issue for which you are responsible will be sent to you near the end of each month and it should be used in preparing your monthly report. It need not be typed, but please write legibly.

The issue which has been assigned to is:

Title Anticipated Completion Date

Narrative description of assignment:

cc: Assistant Administrator
Issues Tracking Monitor

129

Oregon Vocational Rehabilitation Division

"Monthly Reporting Memorandum"

To: Date:

From:

Subject: Issues Tracking for

Below is (are) listed the issue(s) for which you have been assigned responsibility by the Administrator. On the back of this memo, please report on your progress for the month of
Return this update to your Assistant Administrator no later than

Please remember that this report is a progress summary. Updates should be limited to from three to five succinct sentences describing what progress, if any, has been accomplished during the month. If you have nothing noteworthy to report, and find the phrase "progressing as planned" an apt description, the letters "PAP" would be an acceptable response. If more detailed information is needed by the readers of the report, they should be able to obtain it directly from you.

Your current issue(s) is (are):

Number Title

Administrator's Office — Joil Southwell,
Harv Schubothe, Assistant Administrators

December 16, 1981

Ross Moran

Progress Report for November, 1981 on VRD Issues and Action Plan

Attached is the Issues Progress Report for November, 1981. This report covers the progress on 16 issues.

No new issues have been added since the last report.

The "Comments" section has been expanded this month to incorporate a brief summary of each issue. All completion dates have been reviewed by the Assistant Administrators and now reflect realistic dates in light of current conditions.

In an effort to reduce duplication costs, the distribution of this report will be limited to the Executive Staff. However, a copy of the report will be posted on the Planning and Evaluation bulletin board for staff edification.

RM: skn
Attachment

VRD Issues Report For November, 1981

Number	Issue/Responsible Person	Due Date	Progress*/Comments
5-1	Strengthen VRD's Information System and Evaluation Capacity Through Application of Federal MIS Resources. (Neil Sherwood)	9/82	S – This issue was initially identified for the tracking system to record progress in executing the Federal MIS contract. DHR requested that it be broken out by component activities. This was done and Issues 5-1-a, 5-1-e, 14-1, 14-3e, and 14-5-a, are some of those components currently being tracked. An extension of the original contract time frame has permitted us to continue contract work and resources through September, 1982. This tracking system report will provide a very general summary progress report. Of course, some additional detail may be found in the reports for component issues identified above. Also, a more detailed monthly progress report of contract work is prepared for the federal project officer and the federal contract officer, and is distributed locally.
5-1-a	Revise and Document a Conceptual Framework for Information Flow and Policy Development within VRD. Publish document. (Neil Sherwood)	9/82	S – As explained in the comments on Issues 5-1, this issue is a component of the Federal MIS Contract. The preparation of this document is a function of all contract work and other agency developments as well. Because of the comprehensive nature of this issue, future progress notes will be found under Issue 5-1, and this will no longer be tracked as a separate activity.
5-1-e	Develop an Improved Forms and Records Management System. Document Results. (Clif Lewis)	3/82	S – This issue was originally undertaken to address the need to systematize the management of forms and records. Because forms/records are important components of a comprehensive management information system, this issue has been addressed in the development of the "model" called for by our MIS contract. Because documentation of this forms/records system is tied to completion of the Business Services Volume of the Manual, the completion date has been revised to coincide (See Issue 12-5b4).
12-5b1	Revise SRF Volume of Manual. (Bart King)	11/81	C – This task has been completed and will be a separate volume of the Administrative Manual.
12-5b2	Revise Employee Services Volume of Manual. (Sue Druffel)	3/82	S – A first draft of the Management Service section of this volume has been written and is being typed. Writing is continuing on the section for represented employees. Re-analysis and scheduling of work remaining has resulted in a new completion date of March, 1982.
12-5b3	Revise Information Services Volume of Manual. (Bob Butler)	3/82	S – This issue is self-explanatory for the MIS section of the VRD Manual. Effort expended to date has been to review the current PE&S and ADP sections of the Manual.
12-5b4	Revise Business Services Volume of Manual. (Clif Lewis)	3/82	S – Draft materials are undergoing review and will require considerable editing. Re-analysis of the remaining task has resulted in a revised completion date.
12-5b5	Prepare Staff Development Volume of Manual. (Sandy Matthews)	3/82	S – A first draft of this volume is near completion. The March target date seems reasonable.
12-5b6	Revise DDS Volume of Manual. (Tim Latta)	3/82	S – The DDS Section is currently on hold until Business Services and Employee Services are completed. Also am working with Terry James on Administrative Manual Sections that require unique paragraphs regarding DDS.
12-5b7	Revise Administration Volume of Manual. (Tom Huffsmith)	1/82	S – The revision of the Administrative Volume of the Manual has been completed in draft form. It is anticipated that the volume will be completed for publication by the end of January, 1982.
14-1	Implement and Evaluate Personnel and Training Information System (PATIS). (Sandy Matthews)	11/81	C – The Personnel and Training Information System (PATIS) was developed to track individual and group training of VRD staff. PATIS is essentially a two-program system: (1) Course History Record, and (2) Employee History Record. Elements of the Course History Record include title and subject, sponsor, target groups, number of attendees, and training hours. The system is programmed to track costs of travel, per diem, and fees for course, contractor, facility, employee, and other special costs. Elements of the Employee History Record include office location, working title, skills, training hours, time loss, and CRC's. One use of this record is to report the employee's training to the supervisor to assist in completion of the employee's performance appraisal. Employee records are updated monthly using a list of employees whose performance appraisals are due; the list is supplied by Personnel. The system has been implemented and appears to be running smoothly. This issue has been completed and will accordingly be dropped from the tracking system.

VRD Issues Report For November, 1981 (continued)

Number	Issue/Responsible Person	Due Date	Progress*/Comments
14.3c	Develop Indexed Repository of Professional/Technical Information. (Bob Butler)	9/82	S – The objective of this system is to store and retrieve, via an index/keyword computer application, all information required in this agency: correspondence, audio-visual materials, publications, reports, and service requests. The pilot project continues with 1800 documents logged and 600 documents on TSO. TSO, however, may not be satisfactory; the best alternative at this point appears to be to develop, in-house, a dedicated VRD keyword/index computer application. We will continue to search for and evaluate other alternatives. The completion date has been extended to coincide with the termination of Federal MIS contract resources.
14.5a	Develop an Automated Comprehensive Accounting and Purchasing System (CAPS) Plan. (Bob Butler)	9/82	S – The objective of this effort is to provide VRD with a plan for the development and implementation of those systems identified as being necessary to provide more effective management and control of VRD's programs. This project is progressing in a very satisfactory manner. The comprehensive system model and recommendations report will be submitted at the end of December. Following executive review, we will enter a detailed systems design phase which will be followed by programming and implementation phases. Federal MIS contract support of this effort will end September 30, 1982. The completion date has been accordingly adjusted.
23	Reimbursement for Medical Services. (Dr. Burwell)	12/81	PS – Effective January 1, 1982, it was anticipated that this agency would begin reimbursing providers of physical and/or mental restoration and diagnostic services at either: (1) the provider's "usual fee" (i.e., that fee normally charged private paying patients), or (2) A fee which represents the "90th percentile" of fees (i.e., that fee which is "customary," when compared with fees charged by most providers in Oregon). Specific dollar amounts representing the "90th percentile" of fees for medical and related services authorized by Oregon VRD counselors and Disability Determination examiners have been computed and printed as "Maximum Automatic Payment Amounts (MAPA)." Beginning January 1, 1982, these amounts, having been inserted into the agency's payment computer programs, would allow comparison of the fee billed by the providers, with the MAPA dollar amount and payment of that fee which is the *lower* of the two. Apparently, there are problems being encountered with insertion of the revised MAPA amounts into the computer payments file. Billed amounts are being compared with outdated MAPA amounts. As a result, monitoring of billed amounts and manual edits are having to be made by Business Services personnel to assure that payments are being at the legislatively-mandated "90th percentile." This problem needs to be addressed by ADP.
24	Draft Policy on Learning Disabilities. (Terry James)	1/82	S – On schedule; pending final decision on implementation of procedures before the draft policy can be written.

*S - Satisfactory PS - Partially Satisfactory - See Underlined Section of Report MP - Major Problems C - Completed NR - No Report

Completed Issues

November 1979 to October 1981

1. Number of Injured Workers Receiving DHR Services.
2. Establish MIS for Evaluation of the Salem Rehabilitation Facility.
3. Develop an Unassembled Examination for VR Specialists.
4. Implement a Remote (Field) Client Tracking System.
5. Reorganize the Disability Determinations Program.
6. Governor's Steering Committee on the Handicapped.
7. Establish Relationships with Corrections.
8. Develop Plan for Reimbursement of Title XIX Costs.
9. Develop an Equitable Sheltered Workshop Fee System.
10. Completion of OVRD 1977-78 Biennial Report.
11. Evaluate the Effectiveness of Job Placement Services.
12. Evaluate the Mental Health/Deaf Project.
13. Develop a System for Tracking Major Issues Under Study Within VRD.
14. Study Ways to Reduce the Duration of VR Services to Clients.
15. Develop Operational Plan With Local Schools.
16. Correction of Safety Hazards at SRF.
17. Update VRD's Capacity to Engage in Program Evaluation Activities by Providing Training to Project Staff and Others.
18. Review and Reuse Client Caseload Procedures.
19. Independent Living.
20. Monitor and Evaluate Sheltered Services Subsidy Program.
21. Develop Grants Management Handbook.
22. Plan and Conduct Field Tests of the Proposed Standards for VR Program and Project Evaluation.
23. Develop Supervisory Training on Dealing with Problem Employees.
24. Implement State Audit Recommendation and Report.
25. Study the Younger Nursing Home Population to Determine Feasibility for Moving Some to Less Costly Care.

26. Clients' Time in Status.

27. Draft Economic Needs Test for VR Clients.

28. Implementation of SB 5555.

29. Field Test the Facilities Information System.

30. Evaluate Population Estimates and Resource Allocation Models.

31. Recast the Client Services Administrative Manual.

32. Train Staff on Users Guide for MIS.

Appendix D

Computer Graphics in Vocational Rehabilitation

Don McLaughlin
West Virginia Rehabilitation Research & Training Center

In recent years we have witnessed a virtual explosion of information on nearly any imaginable topic. One simply needs to visit the local newsstand to develop an appreciation of the quantity and variety of information available to the general population. Managers of organizations, such as vocational rehabilitation agencies, generally have access to enormous quantities of program or organization-specific information. It is generally agreed that effective decision making presupposes the availability of timely and accurate information. This is true whether the decisions are made by the counselor in managing a caseload or the agency director in managing the agency itself. In spite of the importance of information to management decision making the volume of information typically available to most managers far exceeds that which the manager can analyze, synthesize, or otherwise process in order that it may play a part in management decision making.

Modern computer technology has developed into an extremely powerful tool for allowing the manager quick access to any information pertinent to the problem or decision at hand. Unfortunately, while modern computer systems are designed to "cure" the information overload problem they have in many respects compounded it. That is, in addition to providing the manager with historical aggregate reports in a timely and accurate fashion, computers provide the manager with the capability to examine the agency's database at any level of aggregation with minimal physical effort. Hence, a counselor may, through a relatively simple dialogue with a computer, retrieve information on an individual client or an individual invoice as well as receive an aggregate report of the total caseload. Furthermore, these computer systems, especially in combination with modern data communications technology, have dramatically extended the sources of information upon which a manager might draw in making decisions. A state agency director, for example, may in the past have been limited to last year's caseload production data for making resource allocation decisions for the future. Now by utilizing this technology the director may, in addition to using the agency's internally generated data, consider other databases in making decisions regarding the distribution of scarce resources to meet agency goals. These databases may include information on economic projections as well as forecasts of future disabled population characteristics based on census information.

While computer technology has greatly extended the ability of organizations to access vast quantities of information, this increased capability has placed an enormous burden on the human users or managers in terms of their ability to absorb the information and integrate it into the decision or problem solution. Various software routines attempt to solve this problem by organizing all information related to the decision into a report with a prescribed format. In order to anticipate "unanticipated" information requirements, these formats are usually designed to be very general in nature. Thus, they typically include the information required to support a particular decision but it is embedded in a larger, more general report. Therefore, it is not unusual for a VR manager to sift through a cumbersome computer printout looking for a particular number or set of numbers. Furthermore, the information needed for the decision may not have any particular distinguishing characteristics and the individual data elements may be scattered over various parts of the report. Consequently, the identification and retrieval of the information required to support a decision may not be a simple task in spite of the computer's tremendous capabilities to do so.

An alternative to the conventional computer printout for the display of information comes from the field of computer graphics. A well worn cliche is that "a picture is worth a thousand words." The computer's incredible capabilities to provide us with decision-supporting information is probably best illustrated in the area of computer graphics. Through the application of computer graphics technology information can be rapidly retrieved and organized by the computer as well as presented to the decision

maker in picture form. That is, the computer can, after selecting the required data, portray the information in graphic form complete with legends, titles, and footnotes. The information can be presented to the manager in a fashion that is readily interpretable and more aesthetically pleasing to view than the computer printout. Thus, by displaying important information in this manner the critical factors for the decision making process can be communicated to the human user more efficiently and effectively.

Computer Graphics Hardware

The general approach to produce computer graphics involves the generation and transmission of graphic control instructions by a computer to some type of graphic display device. This device translates these instructions into operations that will represent the information in a pictorial fashion on that device's visual media. The actual implementation of this process, however, varies considerably depending on the particular type of graphic display.

One graphics device which is rarely thought of as a graphics display is the standard line printer common to most computer systems. While widely used for printing of standard reports, these devices can, through controlling the paper advance and carriage of the printer, produce a wide variety of graphic displays. The primary advantage to the use of line printers for graphic display is their availability as they may be found on most general purpose computer systems. Unfortunately, the graphic products of these devices are somewhat rough in terms of resolution since the graphic control is limited to the individual character positions on the printer's carriage.

Another popular computer graphics device is the pen or incremental plotter. This device consists of one or more pens attached to a control arm over the plotter bed. The computer can control the horizontal and vertical movement of the pen as well as whether or not it is in contact with the paper mounted on the plotter bed surface or platten. By issuing the appropriate sequence of pen movement instructions, the computer can draw graphic representations of information of virtually any degree of complexity, such as bar graphs, pie charts or line graphs. The same techniques can be employed to label and annotate the graphics with text using any of dozens of type faces.

Recent advancements in the technology associated with plotters, particularly the use of internal microprocessors as intelligent controllers, have allowed plotters to become increasingly more sophisticated and in many cases less expensive. The Hewlett Packard 7221A, for example, has the capability to draw in any of four colors. Through remote commands from the computer the plotter will select the appropriate pen, remove its cap, remove it from its stall and draw the requested figures in the desired color. At the completion of the task the plotter arm will return the pen to its stall, place a cap on it and either select a new pen in the same manner or return to its previous position on the plotter surface.

The primary advantage to the use of this type of equipment as a graphics device is the extremely high quality of its output. It is not atypical for this type of device to have a resolution of .0015 of an inch or to be capable of repeating a previous drawing to within .001 of an inch. The specific capabilities of pen plotters vary considerably depending on the manufacturer, model and options, however, they tend to produce high quality output with minimal operational or production expenses. The primary disadvantage to this type of graphics device is its typically slow speed since any graphic rendering must be constructed from numerous mechanical pen strokes.

The computer graphics technology which has seen the most dramatic growth in recent years is the use of the Cathode Ray Tube or CRT. This device, which has a display similar to the home television set, allows the computer (and its human user) to rapidly draw virtually any image they can conjure up. The use of color CRT's is gaining in popularity resulting in substantial enhancements in the aesthetic quality of graphics displays as well as the communication of computer-supplied information.

The primary advantages to this type of graphics device include the ability to draw rapidly one or a series of high quality graphics data displays with very little effort on the part of the user. Further, since the display is generated electronically, it is constructed at extremely high speeds allowing the user to produce and alter graphics in an interactive fashion. One of the primary disadvantages of this type of equipment is its relatively high cost. Currently these devices tend to be slightly more expensive than pen plotters and considerably more expensive than standard alphanumeric CRT terminals. However, continued advancements in integrated circuit technology and mass marketing resulting from their increased popularity will undoubtedly drive the costs down considerably. Another major disadvantage of this type of graphics device is the lack of hardcopy output inherent in the use of the CRT. Devices designed to convert the video image to hardcopy (such as film) are available although they tend to be expensive.

While the devices described above represent the most widely used graphics display devices, there are several others that are frequently used. Current trends suggest that their application will continue to grow in the future. The most common of these devices is the printer/plotter, which typically serves as a printer but possesses the capability to produce relatively high resolution graphics output on plain printer paper. One method for accomplishing this is by impacting the paper with a very small print hammer to form dense patterns of dots. Although not of as high quality as pen plotters or CRT display, they do represent a significant increase in quality over the standard printer. Additionally, such devices currently provide the most inexpensive approach to the production of computer graphics.

Another device that possesses considerable computer graphics capability is the laser printer. While it typically serves a super high speed system printer, its laser xerography printing technology makes it well suited for high speed graphics. Unfortunately they tend to be prohibitively expensive for computer graphics applications in state vocational rehabilitation agencies. They may be cost effective, however, when used in conjunction with a high volume printing production application such as a centralized state computing facility.

Computer Graphics Software

The recent increases in the intelligence and capabilities of computer graphics display devices have been paralleled by a growth in the sophistication in the devices' graphic command language. Unfortunately, in spite of the current sophistication of graphics hardware they still react to instructions presented to them in a very cryptic fashion where any given instruction controls only the most primitive of graphics functions, such as the raising and lowering of pens. If, for example, a user were required to interact with a plotter, a plot of only minimal complexity would require the user to issue hundreds or possibly thousands of plotter instructions. To make matters worse, none of these instructions would have any inherent meaning to the user.

One approach around this problem has been the development of software subroutine libraries. The libraries generally contain large numbers of computer program modules each of which is designed to translate the user's graphic requirements (expressed more closely to human language) into the control language of the particular graphics device. A specific module, for example, might, after receiving a few parameters from the user, draw a pair of labeled axes on a pen plotter. The issuance of this single module (a minimal effort on the user's part) might very likely result in several hundred device instructions being sent to the plotter. The major drawback to the use of these libraries is that the program modules are usually written in and usable by a particular computer language, typically Fortran IV. Thus, computer graphics displays of management information can only be generated by a Fortran programmer, or through the use of a program that a programmer developed.

An alternative approach to the use of computer graphics is the development of large general purpose packaged programs. These packages may be constructed from the subroutine libraries described earlier but eliminate the need for the user to interact with any of the modules directly through a pro-

gramming language. Thus, the user can express his or her graphics needs to the computer in a single English-like language. Several organizations have developed packages such as this which greatly extend the capabilities of sophisticated computer graphics to the noncomputer professional community. One such package is called SAS/GRAPH. This package can be integrated into the Statistical Analysis System (SAS), a popular data analytic package, thus providing the user with all of the statistical and data management capabilities of SAS as well as a set of easy to use procedures for generating a wide variety of computer graphics.

The graphics procedures in SAS/GRAPH include the capability to produce, based on the user's data and display specifications, line graphs, vertical and horizontal bar graphs, block charts, star charts, and pie charts. Furthermore, this package allows the user to specify such functions as the color of any given segment of the desired display as well as area filling patterns and line types. Additionally, it allows labeling or any other textual material to be drawn in any of eleven user-selectable type faces and virtually any size consistent with the capabilities of the graphics device. It should also be pointed out that SAS/GRAPH, as well as many other general purpose graphics packages, is device independent. That is, while the various types of graphics equipment use a wide variety of control languages, this package can communicate with and control the graphics functions of several types of plotters, terminals, and other devices.

From the user perspective the single most important characteristic of this graphics package is its ease of use. Through a simple set of command statements the user can very rapidly produce any of a number of graphic displays. *Figure 1* shows a short program designed to produce and label two pie charts for the caseload distribution of one state VR agency. Although the data set used in this example is very simple it would not be any more difficult to perform the same operation on a subdivision of the agency, such as a district, or for that matter, larger organizational entities such as at the regional or national level. One of the pie charts produced by the SAS/GRAPH program described here is shown in *Figure 2*.

Another interesting feature of SAS/GRAPH is the capability to produce maps with the geographic entities colored and fill patterns coded to indicate the levels or characteristics of the user's data. One application of this capability within a VR agency might be the production of a map representing the annual referral rates for each county (or other geographic subdivision) in the state relative to the counselors in the same area available to serve those referrals. Such a map would provide a state agency director with invaluable information to support decisions associated with the optimum distribution of manpower resources. A map based on a similar concept was developed as part of an experimental project conducted by the Oregon Vocational Rehabilitation Division and the West Virginia Research and Training Center. One of the results of this activity is shown in *Figure 3*. This map represents the ratio of applicants for service to the estimated number in need of services on a county by county basis. Clearly it can be seen by this map that counties coded in red have substantially fewer applicants than the service needs estimates would indicate. Similarly, a map for any geographic area and data can be drawn by applying virtually identical procedures. Only the database and the labeling information need be changed to produce a map for a region or the entire nation. *Figure 4*, for example, shows such a map representing the SSDI cost per client rehabilitated for general VR agencies in Region IV.

Computer graphics displays of information generally communicate more effectively than tabular or textual material. It may at times be necessary to view several versions of a graph or chart to determine which mode or style of presentation best communicates the critical points. Likewise, a manager may find it necessary, in evaluating various decision alternatives, to examine the same information across several settings (i.e., counties, districts, etc.) on a series of related information or a single setting, such as referral sources for a single county. Variations in the mode, context or style of graphics displays can impose substantial burdens on a graphics artist who must completely redraft each graph or chart. This is a trivial matter for the computer, however, since it can alter the necessary parameters or redraw a graph in only a few seconds. The demands on the user for this feat are practically nil. A comparison of

Figure 5 and *Figure 6* illustrates the inherent flexibility of computer graphics. *Figure 5* shows a line graph with a plotted line representing the absolute dollar expenditures by one VR agency over a series of years. An additional line shows the expenditures after adjustments for inflation for the same period of time. This graph clearly shows that while the absolute expenditure levels have remained relatively stable (with the exception of one year), the actual "buying power" of the agency has experienced a significant downward trend. The addition of two single word commands altered this graphic display into the one shown in *Figure 6*. Although this graph represents the same information as previously described, the addition of color filling produces a somewhat dramatic effect. Consequently, many people would find Figure 6 more effective in representing the impact of inflation on the agency's budget.

This discussion has not provided a comprehensive review of the field of computer graphics or its application to vocational rehabilitation. Quite the contrary, the topics described here represent only a small sampling of the field in general as well as its potential in the management of rehabilitation programs. The inherent flexibility of digital computers and their associated graphics devices presents almost limitless possibilities in terms of the display of system or program information. Currently, considerable efforts are underway to develop new techniques and enhancements to existing areas that may optimize the effective utilization of appropriate information for management decision making. This in turn should, by definition, result in increased efficiency and effectiveness of rehabilitation programs.

It seems trite to close by saying that computer graphics represents the wave of the future. Yet the entire field is experiencing an enormous expansion. The rapidly reducing cost of computer graphics equipment and dramatically increasing intelligence of modern computer graphics equipment are removing this powerful tool from the domain of the specialist and placing it in the hands of the user. This trend is further evidenced by the increasing number of personal computers being marketed with substantial graphics capability. The near future should witness the inclusion of graphics devices (particularly of the CRT variety) and the software companions as common fixtures on virtually all general purpose computer systems. Furthermore, it seems very likely that within the next five years the use of computer graphics for the display of information will at least rival if not exceed the use of the computer printout.

```
DATA AREA;
*  PIE CHART;
INPUT AREA $ 10-25 PERCENT  40-47;
CARDS;
        FIELD SERVICES          53.5
        FACIL. OPER.            13.6
        SHELT. SERVICES          7.9
        DISAB. DETERM.          14.5
        ADMINISTRATION           8.5
        OTHER                    2.0
OPTIONS DEVICE=TEK4662;
PROC GCHART; PIE AREA/SUMVAR=PERCENT FILL=SOLID;
TITLE1 F=TRIPLEX  C=BLUE  H=2 'VR EXPENDITURES';
TITLE2 C=RED  F=ITALIC  H=1 'TOTAL AMOUNT:  $21,576,340';
FOOTNOTE1  C=BLUE  F=ITALIC  H=1 'FISCAL YEAR 1980';
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Figure 1

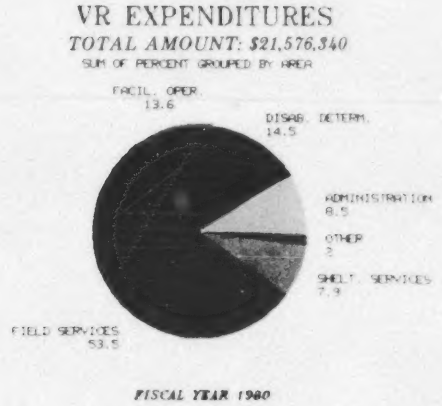
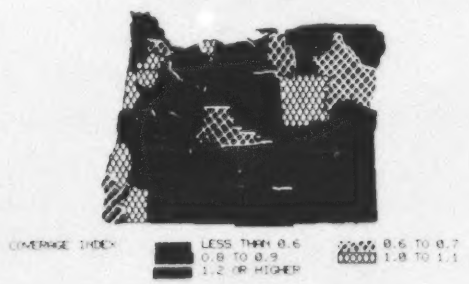


Figure 2

OREGON VOCATIONAL REHABILITATION DIVISION

GEOGRAPHIC EQUITY OF SERVICE

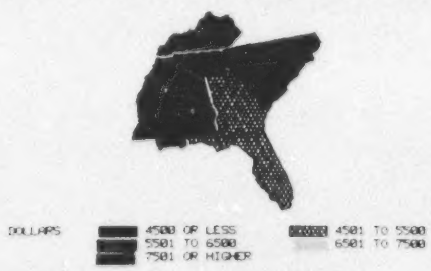


INDEX RATIO OF APPLICANTS TO ESTIMATED IN NEED OF SERVICE

Figure 3

REGION IV – GENERAL AGENCIES

SSI COST PER CLIENT REHABILITATED



FISCAL YEAR 1979

Figure 4

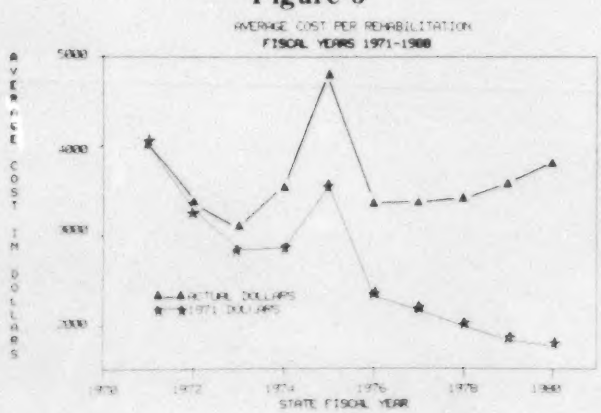


Figure 5

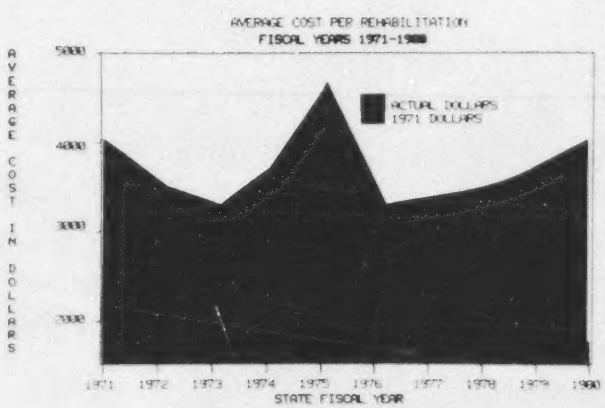


Figure 6

Appendix E

Uncomplicating: Software Acquisition

David H. Miller
West Virginia Research and Training Center

Software, Programs, Systems! What Do All Those Words Mean?

In this age of automation, especially in the area of information processing, computers are being used by all sizes of organizations in both public and private sectors. With this advent of computers there is a new jargon which managers must be able to understand to make intelligent decisions.

Software

Software is the sequence of commands which instruct computers to accomplish particular functions in a specified order, often referred to as programs. If you were trying to cook, software would be like part of a recipe — the instruction for what ingredients to combine or in what order.

Programs

Programs are a selected group of sequenced commands which process the inputed data into desired and definable results. Again for the person who is cooking, this would be equated with a complete recipe for one particular dish; it would have all the instructions from getting the ingredients and preparing the utensils to serving the finished dish.

Systems

Systems may be a single program but most often they are complex sets of programs. That is, they are a group of programs in a sequenced order to perform several functions. The term system is also used sometimes to refer to the configuration of hardware (equipment or devices). This would be not one recipe but several. Similar to preparing a whole meal — there are recipes for the meat, vegetables, breads, desserts, etc. The person cooking must start the different recipes at different times and with different ingredients, but it is all to be ready and served at the same time.

Software Packages

Software Packages can be a program or system of programs which can be used by more than one organization. Nearly always it is acquired from outside the organization which is going to use it. And with its acquisition comes documentation and support agreements. Documentation is descriptions of all aspects of the package, especially the technical aspects. Support agreements are contracts which state the responsibility of the vendor to correct errors, make changes, or up-grade the package. There are two major categories of software packages: operation packages and application packages. Continuing with the comparison with cooking, this would be like having a friend who is willing to share an old family recipe. First they get together with you and show you how to make it. Next they give you the actual written recipe. And lastly if when you attempt to make it you have problems they agree to help if you call. The written recipe is documentation. The showing how to and the willingness to help if problems occur would be support agreements.

Operation Packages

Operation Packages are sometimes referred to as "system packages" because they either simplify the use of computer devices or increase the efficiency of their operation. In other words, operation packages are the software that direct the devices to operate in a consistent definable manner. Operation packages would be similar to the instructions for operating the stove and/or other cooking equipment. Or in some cases, they would be like the directions in the recipe for preparing the stove and other utensils.

Application Packages

Application Packages are software packages which interact with operation packages to perform specific processes on a particular type and/or category of data, i.e., accounts receivable, inventory control, etc. These are like the cook preparing a recipe. The preparation of the recipe interacts with the directions for using the stove and other utensils.

Users

Users are in the broadest meaning anyone who has "contact" with a system. That is, those who collect the data, input the data, develop or acquire the software, operate the equipment, or receive (use) the output. Completing our cooking example, users would be those who have anything to do with food preparation, cooking, serving, and consumption.

How Do I Go About Getting Some Software?

There are three major means of "getting" software: (1) develop it, (2) legally acquire it, and (3)"steal" it (illegal acquisition). Historically, developing or "making" your own software is the most common. This is often referred to as "in-house development." In-house development involves having your own staff of analysts, designers, and programmers to study, design, and code programs which will solve your problems. With the lack of available people skilled in the areas of data processing in addition to high salaries, it has become impractical for many organizations to develop their own software packages. This is especially true in most governmental agencies who rely on public funds and governmental acquisition of funds. As a result, the acquisition of software has emerged in place of in-house development. Acquisition means both buying and bartering of services or products.

Acquiring via Bartering

The most often available and used source of acquiring software via bartering is called "user's groups." A "user group" is a group of data processing professionals who are using computer hardware of the same brand name, (i.e., DECUS is a user group of Digital Equipment) or use computer technology in a particular area, (i.e., education, banking, etc.). The process involves exchanging or giving programs or systems which have been developed to the others in the user group. The advantages of such groups are low cost or free software and the availability of technical assistance. The greatest disadvantage is poor documentation, lack of support agreements, and the possibility of error-prone software. User groups are only as good as the software that users are willing to exchange.

Acquiring via Purchasing

There are five avenues of purchasing software: (1) computer manufacturers, (2) software houses, (3) software brokers, (4) computer stores, and (5) turn-key contractors.

Computer Manufacturer: Historically computer manufacturers are the major supplier of software. This is still true today mainly because operating packages are sold with equipment. However, computer

manufacturers are losing hold of the applications market. Many organizations who are in the market for computer technology are realizing that the company supplying the hardware does not necessarily have the best software for it.

Software Houses: This supplier of software is taking the world by storm, especially in the area of application packages. Software houses are companies whose only business is development and marketing of software packages. Usually software houses will either contract to develop customized software for a user or will develop packages for mass distribution. By selling the same package to several users both the seller and buyer benefit. Sellers recoup development cost quicker and increase profits. Buyers can purchase the package at about 70% less than the cost of having it developed.

Software Broker: A third supplier which is not as visible as those previously mentioned is the software broker. These companies function as go-betweens for developers and buyers. Often the software that a broker represents are ones that another company has developed in-house and is attempting to recoup some of the development cost by selling it to others. In some cases brokers also represent the small developer who does not have adequate capital to market his/her products nationally.

Computer Stores: A fourth supplier of software is the computer store. They are the new upstarts in the marketing of software. Most often computer stores specialize in software for micro-computers, (i.e., Apple, Radio Shack, Texas Instruments, etc.). Their market is the computer hobbiest and small businesses.

Turn-key Contractors: The fifth supplier of software is the "turn-key systems" contractor. "Turn-key" means that all that is needed to have the hardware and software fully operational is to turn on the machine and supply the data. These companies are contracted to purchase the necessary hardware, purchase or develop the software, and install it all fully operational at the users location.

Software acquisition is very similar to getting a house. One could purchase or trade for an older home. Whenever one gets an older house it is with the assumption that it has its flaws and faults, and you get it "as is." This is similar to getting software through a user's group — the software has to be accepted "as is". If one were in the market for a new house there are several avenues to take. One way would be to contract the design, construction, and complete finishing of the house so that when the contractor is done all that is needed is to move in. The "turn-key" computer contractor does the same thing — presents a completed, ready-to-use product. Since having a house completely done is so expensive, many only contract to have the "shell" of the house built with the idea that they will do the finishing. It would then be possible to shop around and finish the inside as needed or desired. This is similar to what happens when one purchases the hardware and operating packages from a vendor but decides to shop around for application packages. These days with the high cost of housing many are purchasing the raw materials of brick, wood, etc. and building their house. There are those who purchase computer technology in the same manner — purchasing different pieces of equipment and shopping around for what is wanted in operating and application packages.

Acquiring Via Stealing

Stealing software refers to the practice of illegally copying and using software from a licensed software purchaser. When software is bought a license to use that software is part of the purchase. You can be sued if it can be proven that you used licensed software illegally. If you are a licensed user and let someone copy it, you could lose your license to use it. Above and beyond all this, when you "steal" software you do not get any support agreements or maintenance of it, and normally the software will not have any of the necessary documentation, which gives the information on how to use and modify the software.

Since stealing is both unethical and illegal the first basic decision to be made is whether to legally acquire or develop the software. In many governmental agencies there is a rather unique situation in that the acquisition of software is not under their direct control. That is, the state has a centralized data pro-

cessing group which either makes or greatly influences the decisions pertaining to the acquisition or development of needed software packages. Such a situation is an out-of-house in-house contractor. That is, the centralized data processing group is in-house to the extent that they are part of the same state government organization. They are out-of-house in the fact that the group attempting to acquire software has no real control or direct relation to them. Such a situation usually is very frustrating and creates both a time lag in acquisition of the software and, at times, inadequate software.

How Do I Go About Deciding Which Software Package Is Best?

The following discussion provides a description of a process which can be profitable in all these circumstances. The discussion provides useful information for the person who is to decide whether to acquire or develop software and the necessary information for establishing justifications for those who must get appoval from another source. In either situation it will also select the most useable software.

Define The Problem

The first step to discovering a solution to a problem is to clearly define the problem in specific and understandable terms. The first instinct of many managers of rehabilitation agencies is to skip over defining the problem and grab for a possible solution. This eagerness to skip over problem definition is greatly influenced by the impatience of American society in general and by American business having a strong tendency toward crisis management; that is, attending to only those things which are on the verge or in the state of crisis. A more adequate, reliable, and acceptable solution would be found if the time and energy were taken to define the problem.

Once the problem has been defined thought should be given as to whether software packages and systems already purchased or developed can provide the solution. This becomes the first question — can we solve the problem with what we already have? If the answer is yes, then the problem is solved. If the answer is no, then there are several things that need to be done.

It needs to be noted that this process of selecting software which is being presented is based on the fact that vendor software packages cost less than custom developed software packages (usually about 70% less). Also, if several software packages meet all the requirements and provide the same benefits, then the one costing the least is most desirable.

Specify The Requirements

The most important step and most often forgotten is to specify the requirements of the software. Requirements, in simple terms, describe what goes in, what comes out, and the different processes from collecting data to the disseminating of reports. The description includes the constraints of the resources available, i.e., dollars, hardware, personnel, etc. A good requirements description includes: a clear definition of the problem that is to be solved along with the context for its solution; a definition of the functions that must be performed; identification of the interfaces with equipment and other software; a definition of the technical aspects such as equipment configuration, languages, storage devices, operating system, etc.; and lastly, a definition of the resource constraints, i.e., people, money, time, etc. Once the requirements are specified you are ready to move to the next step.

Gather Information

The next task is to gather all the available information on the packages which you can acquire — via barter or purchase — that relate to solving your problem. As the information is being gathered there can be some broad assessment of the packages as to whether they deal with your specific problem.

There are two main ways of finding out about available software packages. First, there are published compilations which normally provide a general description about each package which they include. The

second way is to contact different companies, providing them a general description of your requirements and then to request information on any package which the company has available for your acquisition.

Make Sure It Will Work

An indepth assessment of usefulness and a prioritizing of the packages can be done when the information on each package has been gathered. Questions which will help in assessing and prioritizing of the software packages are:

1. Will the software package do what you need?

Compare your requirements with those documented and promised by the package. How close are they? Does it provide the absolute minimum that you need? At this point several of the packages will be dropped from the list of possibilities leaving a smaller, more select group of packages from which to choose.

2. Can the software package work on the equipment you have?

This is somewhat a technical question but will weed out several other packages from consideration. This question focuses more on what equipment is required for use of the package rather than the name brand of the equipment.

3. Can the software package work with the other software packages and systems that you are using?

This question is an extention of the previous one. It is really asking whether the package can run with your operating packages. Is it written in a computer language which your equipment can use? And how easy will it interface with your other software programs and systems?

4. What extra things will the software package do above and beyond meeting the basic requirements?

In other words, what does this package do that you may not need but would be nice to have? These extras are often referred to as "bells and whistles."

5. What does it take to run the package?

This is really a performance question. How much does it cost to run, in dollars and in computer time? How much does it cost in person-hours? What is the burden/benefit cost? The best source of such performance evaluation is other users.

6. How difficult is the software package to up-grade or change?

Every package will at one time or another require changes to be made for it to remain relevant to the user's needs. Making these necessary changes such as adding a new field of data or interfacing with newer programs is what is referred to as software maintenance. The package needs to have some capacity for expansion and modification — this has impact on record lengths and file capacities.

7. What would you have to do or what changes would have to be made to get the packages operating successfully in your present organization?

Installation of any software package will require changes; you must define and specify these changes. Personnel will require some training or, at least, orientation. A new package increases the work load —

what effect will this have on the operation of other systems? Will it be necessary to change the equipment configuration, procedures of operations, schedules, or forms? Usually the cost of getting a software package operational will far exceed the purchasing price of it. Therefore, know what you are in for. Find out how much and what kinds of assistance the vendor is going to supply. Also study how long the conversion process will need to be — can you immediately go from your present way of doing things to the software package or will both need to be running simultaneously for a period of time?

8. How easy is the package to use?

Part of this question has to do with how well the package is documented. But another part is what kind of burden does the software package require on those who have contact with it. Is the output clear and understandable? How difficult is it to operate; in other words is it "user friendly"? How complex and attainable are the needed inputs? For the package to be successful it must supply the user's needs with the least amount of burden.

9. What documentation comes with the package?

With every piece of software questions and problems arise. To find answers and solutions, good, clear, comprehensive documentation must be on hand. Usually the best tool of evaluating packages is the quantity and quality of the documentation provided. A fairly comprehensive list of documentation which should be on hand is: (1) user's manuals; (2) flowcharts; (3) layouts of the inputs, internal records, and reports; and (4) instruction manuals for preparing inputs, utilizing outputs, and operating the package. Such documentation should meet the needs of the system analyst, programmers, computer operators, input suppliers, and output users. If little documentation comes with the package a further question may be: what documentation can be acquired and for what price? (Note: Many packages are delivered in compiled or object-language form, which is extremely difficult to modify. If possible, require a source-language listing which will make it possible to modify and maintain the software.)

10. What is the vendor going to do for you?

The real question is to what extent is the vendor going to support the installation and maintenance of the software package. Also, what kind of support will be supplied. Will the package be maintained by the vendor? Will the vendor supply changes or up-to-date versions of the package? Who is responsible for correcting any problems with the package? Will the vendor modify the package to meet your specific needs? What about training of your personnel, will the vendor supply it? If so, when, where, and to what level of sophistication?

11. What is the history of the package?

Knowing the history of a software package may provide a basis for knowing if you are the guinea pig of a new product or the benefactor of other's trials. The vendor should supply you with all the pertinent data as to date of development and installation, who developed it, and for what reasons. Also you should request a list of present users of this software package. You should contact several users for their evaluation of the package. Remember, you will probably be as satisfied or dissatisfied with it as they are.

Determine Cost

These questions cover the usefulness of the software package but we cannot forget the financial aspects. The final question is "How much is it going to cost?" Do not be fooled by thinking the cost is only the purchase price of the software package. Usually this is incidental compared to the costs of implementing and maintaining it. Implementation cost covers such things as modifying the package to meet your specific needs, training personnel, modifying existing systems to interface with the new

package, converting files, and changing or installing equipment. Part of the question of cost may also relate to what kind of arrangements can be made with the vendor. Can it be leased or just bought outright? Who pays for modifications and changes?

At this point you should have before you a prioritized list of available software packages with associated costs. This is a long and time-consuming process but it will be rewarded by a successful, well functioning software package. Probably, you have discovered that there are only a few software packages left from which to choose. Among those software packages left, which meet the requirements, the question still remains as to how to choose between them, especially if they cost about the same.

Other Tools For Evaluating Software Packages

The remaining heavy weight evaluation tools are user evaluations and bench mark testing. Talk in-depth with people who are using the package. Ask them specific questions about the vendor's support, delays, errors, performance, and problems they have had with it. There are published reports on user ratings of software packages which may also be used in evaluating the packages and vendors. Secure the ratings and judge them according to your needs. Finally you may want to test the packages on your system. It requires a lot of time and expense to design an adequate test, prepare the input data, and evaluate the results.

However, if the package is a new product or has very low user ratings, testing of the package on your own equipment is a necessity.

Well, you should now be at the point of making an informed decision. If there are software packages available which fulfill your requirements then the only question is which one to purchase.

What If No Suitable Package Is Available

But if there is not any suitable software package available, one which meets all your requirements, then there would seem to be four options available:

1. Lower your requirements so that a software package can fulfill them;
2. Purchase a software package which can be modified to meet all your requirements;
3. Contract the development of a customized software package;
4. Or, develop the software in-house.

If one lowers the requirements, then there needs to be a recycling back through the process of whether there are packages available. If one decides instead to modify a package to meet the requirements, then a particular package must be decided upon and a contract for needed modifications negotiated.

If, however, neither one of these options is adequate, then the software must be developed, either in-house or by a custom contractor. If you have the capacity for in-house development, then there needs to be a feasibility study and estimation of costs. Having those facts in hand a decision needs to be made as to whether to go with in-house development or not. If there is not in-house development available, then the option is to contact a custom developer. You should receive bids on the costs of development and then a decision will need to be made as to whether to contract development or not.

What Is A Sound Contract

In those instances where a contract is to be signed a good sound contract must be *negotiated*. In other words, do not just accept the vendor's contract. A comprehensive and sound contract is the final milestone before implementation of a good software package. Data Pro Research Corporation list twelve key terms and conditions which should be considered.

1. The guarantee period after installation, during which the supplier will correct all bugs (errors) and furnish all required maintenance at no additional cost, should be clearly defined. (This period ranges from 30 days to one year for most of the current packages.)

2. If the package is found unacceptable, the contract should permit its return within a specific period after installation at no cost to the user.

3. A specified penalty should be imposed against the vendor for late or incomplete delivery and installation of the package.

4. If your organization will be among the first users of a new package, it may be possible to arrange for a reduced price and/or additional support.

5. All agreed-upon modifications to the package, together with the responsibility and deadlines for making them, should be specified in detail.

6. Objectionable restrictions on the modification or use of the package should be eliminated from the contract.

7. The installation, support, training, and maintenance promised by the vendor should be spelled out in detail in the contract, together with the additional costs of these services, if any.

8. The names of the specific individuals who will supply the on-site technical support, or the specific qualifications these individuals will have, should be specified in the contract. (It is particularly desirable in the case of a new, untried package to have those who developed it present at installation time.)

9. The method to be used for correcting bugs (errors) discovered after installation, and the guaranteed response time for correcting them, should be specified.

10. The contract should specify exactly what items, in what forms, will be delivered (e.g., source decks and listings for all programs plus all relevant documentation at installation time, followed by modified or improved versions of the package whenever these are made available to new buyers).

11. The buyer should be willing to agree to reasonable clauses that protect the supplier's proprietary rights for forbidding resale or other unauthorized distribution or use of the package.

12. Payment for the package should be contingent upon delivery of all the promised products and services and successful operation of the package in your installation.

If I Purchase A Software Package, Is That All?

There are at least two more steps yet to be completed before you can accurately state that you have completed the acquisition of a software package. First is to get the package fully operational; this is often referred to as implementation. The time factor of implementation is of course dependent upon the complexity of the software and its interfacing with existing equipment and systems. Installation or im-

plementation is not complete until the package is operating at peak efficiency and is delivering error-free results. This must be accomplished in the context of being fully interfaced into your total system.

The second step is evaluation. The software package must be evaluated as to whether it is delivering all that was promised and contracted. Are there any significant problems, deficiencies or limitations which are identifiable? A written report should be a necessary part of this evaluation. This report should include a description of the performance and reliability of the software vendor as well as evaluation of the software package itself. This report may save a fellow purchaser the trouble and problems which you have had to experience.

This All Sounds Pretty Difficult
Where Can I Get Some Help When I Need It

The West Virginia Rehabilitation Research and Training Center is willing to provide technical assistance in your acquisition of reliable software which will meet your needs. You will have to make the decisions, but the WVRTC staff can gather relevant information, assimilate it, and present it in an understandable fashion. The axiom, "The better informed the decision maker the better his decisions" is true. The WVRTC staff of system analysts, computer technicians, and researchers can and will provide technical assistance with computer and software related problems upon request.

Appendix F

Computer Acquisition and Operation*

Mississippi Vocational Rehabilitation for the Blind

Background

The Rehabilitation Act of 1973 and subsequent amendments thereto have placed greater demands on rehabilitation agencies in terms of service provision to clients and agency accountability for such services. Thus, like other rehabilitation agencies, Mississippi Vocational Rehabilitation for the Blind (MVRB) experienced a sharp increase in the amount of raw data generated, routine reporting requirements and special reporting requirements. MVRB soon realized that its manual record-keeping system could not keep pace with the increasing data output and began searching for an alternative method which, because of cutbacks in personnel and budgetary constraints, had to be inexpensive and capable of simple and immediate implementation. The answer was found in MVRB's sister agency, Vocational Rehabilitation State Department of Education/Mississippi, which had been developing a system of computerized information retrieval since 1968. In the fall of 1973 the directors of both agencies met and an agreement was reached by which MVRB would use the general agency's Client Information System, but without modifications, in exchange for the processing costs. In mid-1974, MVRB began collecting statistical data for FY-75 caseload reporting. In 1977, the agreement was expanded to include MVRB's use of the general agency's Case Service Expenditure System which permitted retrieval of limited financial data. Under the conditions of the original expanded agreement, MVRB's involvement was strictly a hands-off role. Although this agreement allowed MVRB to meet its immediate needs, MVRB management was keenly aware that the time lapses in processing MVRB data (ten to twenty-eight days from collection of data to its return to MVRB district offices in a usable form) greatly negated the three (3) hallmarks of a sound information system: responsiveness, timeliness, accuracy.

Assessment of Problem Areas

With the award of a contract to establish a Model Evaluation Unit (MEU), the Director of MVRB requested that the MEU analyze MVRB's data processing needs and explore possibilities for actualizing an internal data processing system. The MEU's Systems Analyst spearheaded the study of MVRB's existing Management Information System. Assistance was provided by the MVRB staff, the consultative services of Gehl and Associates (Atlanta, GA), the consultative and technical services of RSA Region IV Federal Office (Atlanta, GA) and the research and analytical services of the MEU staff. The study team identified the single most glaring deficiency to be the lack of access to available data in a form capable of supporting the decision-making process necessary for managerial efficiency and effectiveness. While instances of non-existent information as a deficiency were also identified, the overriding concern was the MVRB had no acceptable method of easily retrieving usable data.

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*Reprinted from *Program Evaluation in Vocational Rehabilitation: Observations*, No. 3. Rehabilitation Services Administration, 1981.

The study team set the following criteria by which to judge alternative solutions to MVRB's data processing problems: (1) flexibility of the alternative proposed; (2) accuracy of information via the alternative proposed; (3) cost of alternative implementation and maintenance; (4) method responsiveness and (5) adaptability to change. Change as used here refers to possible future alterations in routine and special reporting mandates as the result of national and/or state programs and policies. Among the possible solutions proposed and considered were: (a) increase the existing staff to expand manual operation; (b) use microprocessor based flexible disk units to store some data; (c) use off-site batch processing; (d) use on-site batch processing; (e) use on-site data entry with off-site batch processing; and (f) use on-site data entry and batch processing.

During the evaluation of these proposed alternatives, vendors of data processing equipment and systems specialists were contacted to secure their expert input. These vendors included IBM, Datapoint, IV-Phase, Telex, and Texas Instruments. Additional evaluative input was provided by the Central Data Processing Authority (CDPA) - State of Mississippi (Jackson, MS), Gehl and Associates (Atlanta, GA), Mockbee, Edwards and Associates (Jackson, MS), South Central Bell Telephone Company (Jackson, MS), and managers of state agency electronic data processing units. Ultimately, the study team reached the consensus that MVRB's needs in data processing could best be served through acquisition of its own data processing equipment and the actualization of a staff capable of systems development exclusively responsive to MVRB's needs.

Equipment Acquisition Procedures

The first step in acquiring data processing equipment for MVRB was for the MEU's systems analyst to develop a *Proposal for Data Processing System* for approval by the MVRB Director and subsequent submission for approval to the CDPA-Mississippi and RSA-Washington, D.C. The proposal was prepared in accord with the CDPA's format as it is the agency in Mississippi which has authority statewide to receive, review, approve or reject all requests for data processing systems. The proposal prepared by the MEU's systems analyst included, briefly, the following:

I. Statement of Purpose

Stated findings of study team and proposed remedial action via acquisition of a data processing system for MVRB.

II. Background

Explained what factors made it expedient that MVRB secure and assume management of a data processing system, how MVRB was currently handling its data processing needs, and justification to support MVRB's request.

III. Summary of Need Applications

The proposal noted that at a minimum seven systems were needed:

A. Case Recording and Expenditure System with the minimum capabilities of:

1. Immediate data entry, validation and retrieval at the state office level;

2. Prompt payment for vendor services as an automatic by-product of the system;

3. Provision of caseload and budget reports for field and district staff on a current basis;

4. Responsiveness to the changing needs of management and of the Federal reporting requirements;

5. Provision for security and confidential information;

6. Supporting fiscal accounting by maintaining records in an auditable manner;

7. Supplying data needs for program evaluation, research and planning; and

8. Alerting management at several levels of any condition which is unusual or in need of immediate attention.

B. Payroll information and Accounting System encompassing the following requirements:

1. Data entry, editing, and retrieval by personnel staff as the need occurs;

2. Automatic generation of all monthly payroll payments and required registers and reports;

3. Automatic distribution of accounting information for state and Federal budgets;

4. Generation of all quarterly and annual wage statements;

5. Allocation of staff and fringe benefit costs by program, area, or district for cost-benefit analysis; and

6. Responsiveness to special reporting requests.

C. Administrative Accounting and Payments System designed to address:

1. Ease of data entry, edit, and retrieval by accounting staff;

2. Generation of vendor payments with required registers and distribution reports;

3. Allocation of expenditures by program, area or district for cost-benefit analysis;

4. Generation of projected costs for the budgeting process; and

5. Line item comparison of budget versus actual costs incurred.

D. Equipment Inventory Tracking System characterized by:

1. Ease of data entry, edit and retrieval by accounting staff;

2. Generation of budget information regarding new and replacement equipment;

3. Allocation of equipment costs by program, area or district for cost-benefit analysis; and

4. Detail information for conducting audits of equipment statewide.

E. Business Enterprise Program (BEP) Information System capable of:

1. Easy data entry, edit and retrieval by BEP staff;

2. Tracking and reporting all financial transactions by stand location on a current basis;

3. Providing for automatic generation of all required payroll statements and reports by location;

4. Generating current Profit and Loss Statements by location;

5. Providing immediate access to equipment inventory and repair history by location, description or ID number;

6. Providing for the auditing of stock goods at each location by producing perpetual inventory reports; and

7. Enhancing managerial decisions by providing current and accurate information for use at the statewide, area and local levels.

F. Management Information and Evaluation System designed to include the following capabilities:

1. Provide state, area, and district caseload profiles for the purpose of allocating agency resources;

2. Provide statistical analysis of case characteristics in order to evaluate and project program effectiveness;

3. Provide data necessary to assign direct and indirect agency costs on an individual case basis for the purpose of evaluating and projecting program efficiency;

4. Provide data necessary to ascertain normal bounds for duration of service provision and to indicate those instances which fall outside these parameters in order to assure program timeliness;

5. Provide data necessary to summarize the financial standings of each MVRB component on a current basis, thereby preventing the under-utilization of Federal allocations in the provision of services to clients;

6. Provide for the project of line-item budget needs based on the most current actual and projected cost figures;

7. Provide storage and retrieval of data thus permitting the agency to respond quickly to requests for information from Federal, state, private and public sources; and

8. Reduce the volume of clerical responsibilities and release valuable manpower for higher levels of professional action.

IV. Alternatives Considered

Alternatives previously noted in this article were discussed in depth.

V. Long Range Plan

The CDPA-Mississippi required that along with a proposal for data processing, the agency submit a five-year plan which addresssed the projected thrust of the agency in terms of data processing. The plan submitted included coverage of such areas as projected upgrades, applications, files, equipment, and the like.

VI. Alternative Selected

Explained how the particular system configuration was selected. This section of the proposal cited the criteria used by the study team, the utilization of existing agency resources, the lack of increase in existing agency budgeting costs, the availability of limited Federal funds, and the fact that no additional agency staff would be immediately required as factors impacting the selection of a system configuration.

VII. System Specifications

The MVRB proposal listed (1) remote job entry, (2) data entry, (3) CICS, and (4) local processing as specifications, addressing each separately so that bids from vendors could be compared equally. (Advertising for bids on data processing equipment is handled by the CDPA-Mississippi which, in turn, advises the agency of the bidding outcome.)

VIII. Source of Funds

Contained a statement to the effect that funds for the acquisition of the proposed system would come from Federal and state appropriations already budgeted, with no more than 15 percent of the system's cost being covered by state-appropriated funds.

It should be noted here that the original proposal submitted to the CDPA had to be revised and resubmitted in accordance with the CDPA's interpretation of the needs of MVRB as described in the original proposal.

The System in Operation

The culmination of more than a year's work came in January, 1980, when a stand-alone mini-computer was installed in the MVRB state office. The acquisition of this equipment signalled, in MVRB, the advent of a new methodology in the agency's design for providing rehabilitation services to Mississippi's blind and visually impaired population.

As of July, 1980, MVRB's data processing system is under active development. Since all MVRB functions revolve around the activities of field or client service personnel and their interaction with clients, major efforts have been directed toward developing an on-line update and retrieval system of client statistical and financial data. When completed, this system will provide timely data for caseload management at all levels of state agency activities. Considerable effort has also been devoted to preplanning systems and brainstorming with MVRB staff in an effort to identify major concerns and anticipate data requirements at each level.

Beyond refining statistical and financial capabilities, there are plans to develop a flagging system to enhance efficiency in agency operations. Such a flagging system would include timely client movement, timely client contact, Annual Review of IWRP, Review of Ineligibility Decision, and Review of Extended Employment in Facilities, to name but a few of the almost limitless possibilities.

NOTE: This prescriptive article necessarily abbreviates certain steps in the acquisition and beginning operation of Mississippi Vocational Rehabilitation for the Blind's data processing system. Requests for specific details or answers to questions may be addressed to the Mississippi MEU at P.O. Box 4872, Jackson, Mississippi 39216

Data System Operation*

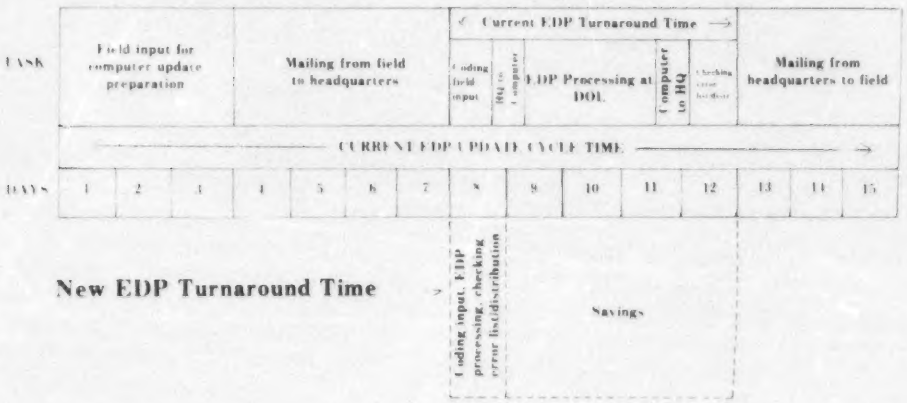
Vincent Finelli, Systems Analyst
Delaware Division of Vocational Rehabilitation

The Model Evaluation Contract has made it possible for Delaware Division of Vocational Rehabilitation (DVR) to make great strides in the area of computerization. Prior to the Model, DVR's daily updating turnaround time averaged approximately 15 days (see Flowchart). Compared to some batch systems this might seem an acceptable turnaround time, but to DVR with its Management by Objectives (MBO) approach, faster turnaround time was required. While operating within the framework of the Model Contract, dollars were *not* unlimited, and were therefore a constraint as to how equipment would be purchased and utilized to speed up turnaround time. As seen in the flowchart, the field input preparation for the daily update consumed three days for management signatures, approvals, administrivia, etc. Mailing from the field via the State-Operated Pony Express required, on the average, another three days. Coding field input into a format ready for keypunching required one full day. Mailing from Headquarters to the Department of Labor's IBM computer (ten miles away) for processing consumed one-half day. Actual computer keypunching, updating, printing, and bursting output utilized three days and another half-day was required for the mail trip to return the computer processed updates to DVR. Error checking and distribution preparation by DVR's Input/Output Clerk required one full day. And finally, the mailing from Headquarters back to the field required three days. One complete cycle of the daily update required 15 working days.

Within the constraints of the Model Contract, where was the best place to target efforts to improve turnaround time without disrupting field staff and working with Delaware's policy against proliferation of computer equipment outside of Central Data Processing?

The most cost-effective place DVR found to improve daily turnaround time was the area of day number 7 through day number 12, inclusive. DVR's analysis showed that with an on-line capability, the block marked "Current EDP Turnaround Time" (six days) could be reduced to one day which is shown in the block marked "New EDP Turnaround Time." It was expected that savings would come from eliminating coding, mailing to and from the computer, and that processing and checking error lists would be greatly reduced.

Flowchart of Average Turnaround Time for DVR - 313
Computer Updated From Field to Headquarters to DOL Newark
For Computer Processing to Headquarters For Data Update
Checking and Return to Field


Current EDP Turnaround Time
TASK
Field input for computer update preparation
Mailing from field to headquarters
Coding field input
HQ to Computer
EDP Processing at DOL
Computer to HQ
Checking error list/distr
Mailing from headquarters to field
CURRENT EDP UPDATE CYCLE TIME
DAYS
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
New EDP Turnaround Time
Coding input, EDP processing, checking error list/distribution
Savings

Flowchart #1

*Reprinted from *Program Evaluation in Vocational Rehabilitation: Observations*, No. 3. Rehabilitation Services Administration, 1981

Aside from the on-line information system of the Delaware State Police, Delaware State Government had *no* capability for supporting on-line, real time operations. DVR therefore turned to the University of Delaware's Burroughs B-7700 time-sharing system. This system was perfectly at home with the hybrid on-line, real time remote batch system that DVR was seeking. Cost justification was in DVR's favor as analysis showed that the agency could maintain data processing at approximately 50% of what it was presently paying and have on-line, real time capability as well. As a sidelight, along with on-line came SPSS, Reporter II, etc. These were added benefits of the Burroughs system that DVR could capitalize on once a conversion from IBM to the Burroughs was made. In fact, that conversion was made readily and the new system is running quite smoothly.

DVR's Input/Output (I/O) operation staff had to learn new ways of data processing. All of the hand transcribing from one document to another was now obsolete. Eliminating the six days at the Department of Labor (DOL) meant no more "slack" time and no more putting off report distribution and keying until tomorrow as backlogs would result. The jobs of keying, printing, and bursting of reports which were formerly the jobs of the DOL's Computer site were now the responsibility of the I/O operator at DVR. Time budgeting throughout the training process was critical during the beginning phases of the Burroughs implementation. The new I/O skills involved the use of printing terminal, display terminal, dial-up acoustic coupler, CANDE (Burroughs editing language), creating computer files, merging files, editing files, titling files, signing on and off, etc. This is very complex for someone who has had no computer experience.

After the few initial bugs of conversion were ironed out and training sessions of field input and I/O staff were conducted, the statistical computer system ran smoothly.

The system's operation looks much like the "old" statistical computer system except currently DVR now has three computer terminals and associated acoustic couplers. Two of the terminals are 120 characters-per-second DEC LA-120's and the third terminal is the Hewlett Packard Video Display Terminal HP 2621A. Additionally, DVR has a CPT-8000 word processor which may be used as a backup terminal for the video display or printing terminal.

The I/O operator receives, batches, keys, edits, runs updates, maintains files, maintains log book, checks edit reports, prints output, and answers field questions for the statistical computer system as compared to the"old" system where batching, coding, mailing, edit checking and distributing were the primary functions.

In Delaware, the on-line, real time has enabled DVR to drastically cut EDP turnaround time from six days to approximately one to two days, reduce data processing costs, and provide more accurate and timely information to the user.

The on-line system also provides capability for special studies such as those which are currently being conducted in COBOL as well as SPSS to support Management's decision making.

Perhaps the most significant addition DVR has made to its EDP system is an on-line, interactive inquiry program which allows a user to efficiently display on a CRT a client's computer record by simply entering the Social Security number.

Appendix G

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Past Publications

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3. 1976	Affirmative Action: A Resource Manual for Vocational Rehabilitation
4. 1977	Utilization of Publications of the Institute on Rehabilitation Issues
5. 1978	Vocational Rehabilitation of Persons with Mental Disorders
6. 1979	VR & the Community: Or the Adventures of Rip Van Rehab (A Novel Approach)
7. 1980	Strategies & Options for Change: A Guide for Rehabilitation Counselors
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